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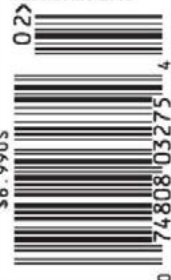
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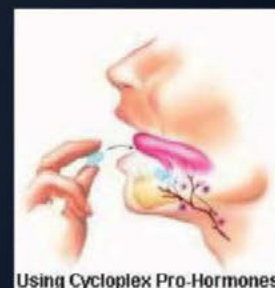
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Cyclosome® technology - the most advanced oral administration technology ever developed is the answer to getting poorly absorbed Testosterone boosting compounds and legal prohormones into the body efficiently and effectively! While the pharmaceutical industry has embraced this cutting-edge technology in recent years, all Hi-Tech, LG Sciences, ALR, Sports 1 and APS Pro-hormones will be the first to utilize this technology in testosterone boosters and anabolic agents.

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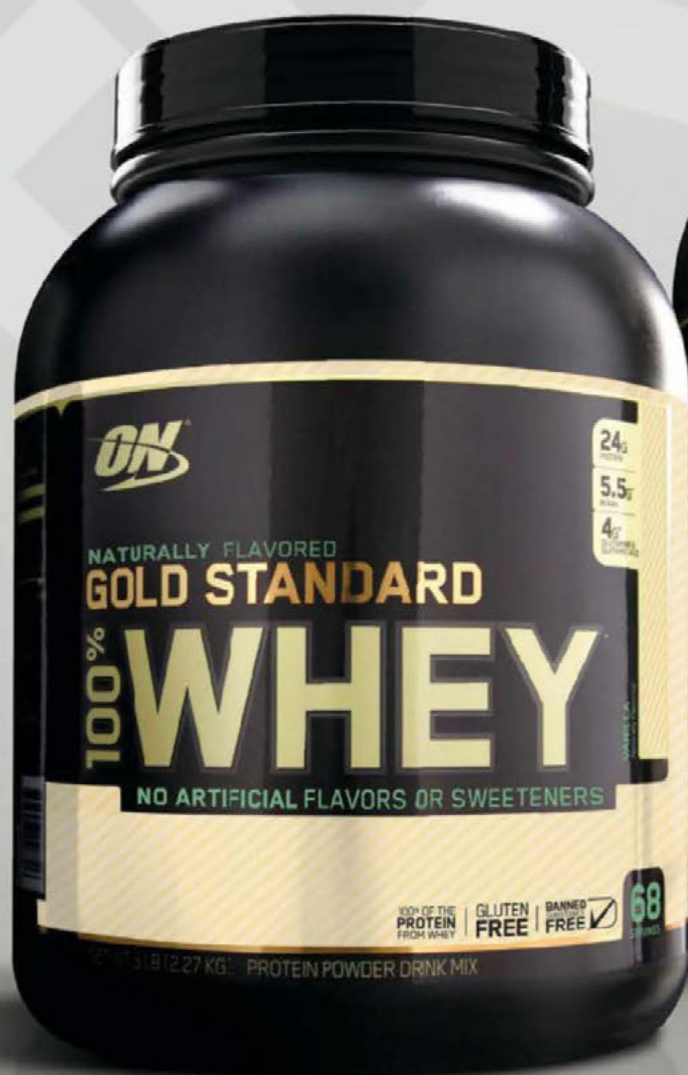
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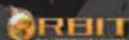


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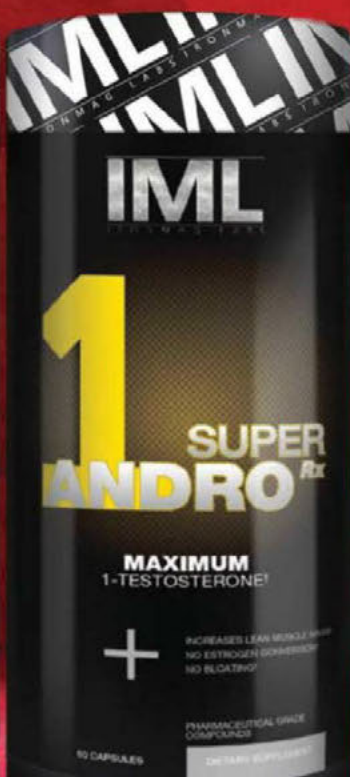
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EDITOR'S LETTER

BY STEVE BLECHMAN, Publisher and Editor-in-Chief

POWER TO THE FREAKS

Bodybuilding has a few genetic freaks who command an extra level of respect, because the athletes have shocking strength to go with their extreme muscle mass. Being a bodybuilder and busting your ass in the gym to build a jaw-dropping physique is a feat that is beyond most mortal men. A handful of pros—men like Franco Columbu, Casey Viator, Dorian Yates, Ronnie Coleman, Johnnie Jackson and Branch Warren—had extreme strength to go along with their extreme development, and they are superhuman legends for harnessing the best of both worlds.

Speaking of bodybuilders who might be from another planet, you would be hard-pressed to find another human being today who has the combination of freaky muscular development and inhuman strength that Akim Williams has. Find out what makes him tick in “Freak Power! Is Akim Williams, a MuscleMeds athlete, the World’s Strongest Bodybuilder?” on page 92.

Another genetic freak, also a MuscleMeds athlete, is Michael Lockett, who took a six-year break from bodybuilding and returned in 2015 to make his pro debut at the Chicago Pro, where he placed second. Read his roller-coaster story in “The Legend of Lockett: From the Ring to the Stage ... and the Gamble That Nearly Ruined Him!” on page 102. Just how much of a freak is he? As Michael tells MD’s Dan Solomon: “I know this may sound a bit crazy, but if I were to stop training for five years, I’d probably still beat a lot of bodybuilders.”

Having the name Sergio Oliva immediately sparks the interest of any bodybuilding fan who has a true appreciation for the legends of our sport. Sergio’s son, Sergio Jr., is following in his late father’s footsteps in more ways than

one. MD’s Peter McGough caught up with Sergio after a monumental win that was years in the making. Learn more in “Diary of a Dream Fulfilled: The Long Road to Pro for 2015 NPC Nationals Overall Champ, Sergio Oliva – One of the Most Famous Names in Bodybuilding” on page 108.

Joshua Lenartowicz has gone from Australia’s number-one bodybuilder to winning two IFBB pro shows in 2015, the San Marino Pro and the Ferrigno Legacy contest. This new sensation weighs a hulking 315 at 5’10” and shreds down to 260 pounds for the stage, with monstrously full delts and truly enormous, sweeping quads. Learn more about him in “A New Thunder From Down Under! Rookie Josh Lenartowicz Is the Best Pro From Australia” on page 118.

The last few years have seen the career of Paige Hathaway skyrocket, with the small-town girl from Minnesota transforming herself into a fitness entrepreneur, cover model, Bikini competitor and SHREDZ-sponsored athlete with over 3 million

Instagram followers. Check out the sizzling photos of Paige in this month’s Major Distraction on page 124, and you’ll quickly realize why she has an uncanny ability to inspire millions.

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physicians, industry experts and research scientists has these reports on improving performance this month:

- *Bile Acids for Fat Loss: Research Update* Fat Attack, page 68

- *Best Nutrients for Improving Power and Strength* Nutrition Performance, page 74

- *BetaPower™ Natural Betaine: For Boosting Strength, Power and Performance*

Supplement Performance, page 78

- *Forced Reps for Accelerated Muscle Growth and Strength!* Muscle Growth Update, page 84

- *Is There an Optimal Rest Interval for Muscle Growth?* The M.A.X. Muscle Plan, page 88

- *The Best Anabolic Steroids for Boosting Muscle Power, Strength*



and Hypertrophy Testosterone, page 128

- *Boost Your Bench and Squat Till You Drop!* Bodybuilding Science, page 138

The rest of the book is packed to the binder as usual— making MD your one-stop, most authoritative source for optimizing muscular development with the latest cutting-edge research on training, nutrition, fat loss, performance-enhancing drugs, muscle growth and bodybuilding science—and exclusive information from the industry experts, insiders and bodybuilding legends who make it all happen. See you next month!

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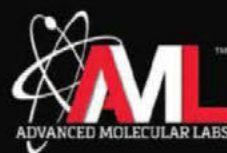
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AMOUNTS PER SUGGESTED SERVING					
PREWORKOUT	400mg	6g	5g	2.5g	2g
COMPETITIVE BRAND #1	DU-PB	NONE	1g (as Creatine Nitrate)	DU-PB	1.6g
COMPETITIVE BRAND #2	DU-PB	NONE	DU-PB	DU-PB	NONE
COMPETITIVE BRAND #3	DU-PB	DU-PB	DU-PB	DU-PB	DU-PB
COMPETITIVE BRAND #4	175mg	15g	3g	NONE	1.5g
COMPETITIVE BRAND #5	DU-PB	NONE	NONE	NONE	NONE
COMPETITIVE BRAND #6	190mg	NONE	NONE	NONE	1.6g
COMPETITIVE BRAND #7	DU-PB	NONE	NONE	NONE	2g
COMPETITIVE BRAND #8	350mg	6g	2g (as Creatine HCl)	NONE	1.6g

DU-PB = Dosage Unavailable, Proprietary Blend

■ = Highest Dosage

A Comparison of the Top 3 Proven Post-Workout Nutrients

	L-Leucine	Creatine Monohydrate	Betaine
AMOUNTS PER SUGGESTED SERVING			
POSTWORKOUT	4g	5g	2.5g
COMPETITIVE BRAND #1	DU-PB	NONE	NONE
COMPETITIVE BRAND #2	2.5g	NONE	NONE
COMPETITIVE BRAND #3	DU-PB	NONE	NONE
COMPETITIVE BRAND #4	DU-PB	NONE	NONE
COMPETITIVE BRAND #5	2.5g	NONE	NONE
COMPETITIVE BRAND #6	2g	NONE	1.25g
COMPETITIVE BRAND #7	DU-PB	NONE	NONE
COMPETITIVE BRAND #8	3.6g	2g (as Creatine HCl)	1.5g

SCIENCE > INNOVATION > RESULTS

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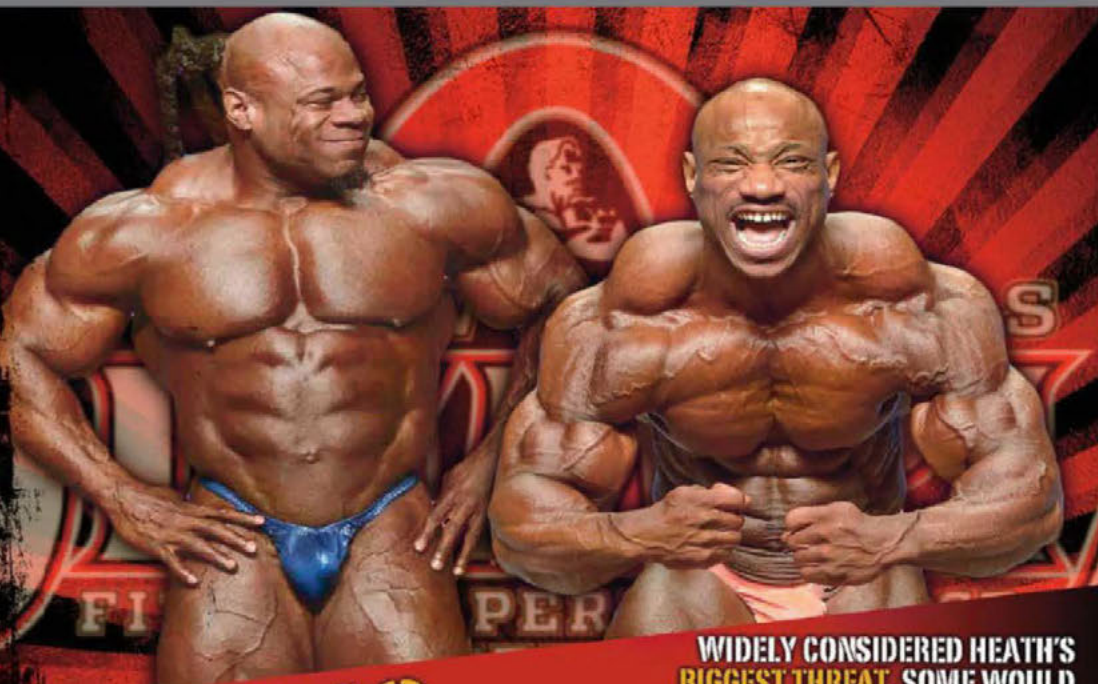


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FEBRUARY 2016

NEWS & VIEWS
FROM THE WORLD
OF BODYBUILDING

EIGHT ROOM



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WIDELY CONSIDERED HEATH'S
BIGGEST THREAT, SOME WOULD
ARGUE THAT KAI, ON HIS BEST DAY,
IS MORE THAN DEXTER CAN HANDLE

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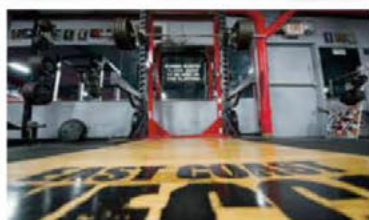
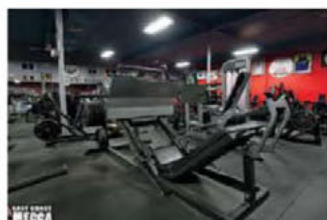
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INSIDE THE EAST COAST MECCA

There are two components to a great gym: The human element comprised of members, staff and management that create a unique and inspiring culture; and the physical element made of up four walls, a roof and the contents within. This month, we wanted to share an inside look at that second part, and show you our carefully selected collection of training equipment that literally covers every angle. Here is your look inside the East Coast Mecca.



UPCOMING CONTEST SCHEDULE

MARCH 26, 2016: NPC Steve Metropolitan Championships (Teaneck, NJ) **ONLINE ENTRY & TICKET SALES—**

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MAY 21, 2016: IFBB New York Pro (Teaneck, NJ) **TICKET SALES—**

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JULY 1-2 2016: NPC Universe-IFBB Pro Qualifier **ENTRY FORMS AND TICKET SALES—**

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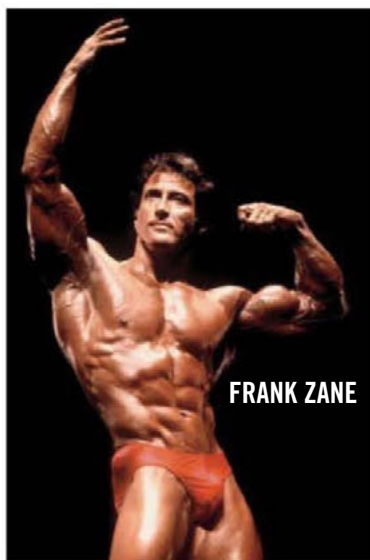
HOW I SEE IT!

WITH **SHAWN RAY, DORIAN YATES AND KEVIN LEVRONE**

Muscular Development is proud to bring you "How I See It," featuring three IFBB Hall of Fame bodybuilders, and legends of the industry that we are honored to have on Team MD. Between Shawn Ray and Kevin Levrone, they have a total of six runner-up finishes at the Mr. Olympia, and Dorian Yates won the Mr. Olympia title six consecutive times.

THE CLASSIC PHYSIQUE DIVISION

WHAT DO YOU THINK OF THE ADDITION OF YET ANOTHER NEW DIVISION, CLASSIC PHYSIQUE, TO THE NPC AND PRESUMABLY THE IFBB TO FOLLOW IN 2016? WAS THERE A NEED FOR THIS DIVISION TO BE CREATED? WHO WILL IT APPEAL TO IN TERMS OF COMPETITORS AND AUDIENCE? DO YOU SEE IT AS A BRIDGE BETWEEN MPD AND BODYBUILDING?



"THE CLASSIC PHYSIQUE DIVISION WILL TAKE US TO A PLACE WHERE HOPEFULLY, WE CAN REVISIT THE LIKES OF A 190-POUND FRANK ZANE OR A 180-POUND LEE LABRADA, AND REMINISCE ABOUT THE BEAUTY THEY BROUGHT TO THE STAGE AND THE PAGEANTRY OF A COMPLETE PACKAGE."

SHAWN RAY

It's OK by me! Why wouldn't the two federations try to offer up a solution for supply and demand, where athletes simply want a platform to display their varying degrees of physical development? I'm definitely not one to criticize the new divisions being added, when athletes' only options would be to limit their options. It comes down to having a shot at winning and losing for each athlete, which keeps them in the gym and evolving!

Classic Physique will bridge the gap between the bodybuilders and physique competitors as it relates to the athletes' individual growth and competitive desires. The number of athletes will grow even more, because they are not forced to compete in divisions they are not built for or desire to compete in.

The Classic Physique division will separate the idea that you have to either be huge, or hold back the muscle-building process to remain streamlined for the Men's Physique division. These athletes can either grow, or come down to a comfortable weight that will allow the audience to bring back adjectives like classical, beautiful, artistic, aesthetic and symmetrical. These kinds of adjectives used to be reserved for bodybuilders when I was coming up. They were inclusive of the entire physique, whereas the shortcoming of the Physique division is the athletes covering up their legs and the lack of poses they display onstage.

The Classic Physique division will take us to a place where hopefully, we can revisit the likes of a 190-pound Frank Zane or a 180-pound Lee Labrada, and reminisce about the beauty they brought to the stage and the pageantry of a complete package. For all the reasons I've mentioned, we look forward to see where this division will go and who will emerge as the leader of the pack.

The Classic Physique division may appeal to just about everyone who loves art and beauty, two words that were

bantered about when I came into the game in 1983, with references back to the likes of Steve Reeves, Mohamed Makkaway and Bob Paris. For the last 15 years or so, fans around the globe have been deprived of admiring and following those types of bodies that were glamorized in the magazines and worshipped by both men and women.

This new Classic division is the bridge between Physique and bodybuilding, that I feel will have more mainstream traction as it relates to promotions and marketing. The desired look is not only achievable for both existing divisions, but it may even become oversaturated with athletes due to the Physique guys, who've been holding back—and would like to actually pose, and display their bodies with movement and action. Conversely, there are many bodybuilders who are not happy with the pressure of pushing the envelope on the size factor. They have been training exclusively to get big in order to win, to the exclusion of focusing on refinement and detail. Now they can drop down into a place of comfort and level the playing field, knowing this division is not size-based but classically judged.

While some may think we have too many divisions, I see the industry adapting and adjusting to the athletes and fans, as well as the sponsors, in a manner that is more inclusive and inviting. Looking at this new division would make a guy like Joe Weider very pleased, as well as our photographers capturing the moments along the way!

It's a good time to be representing the number-one bodybuilding magazine in the world, and have a front-row seat to witness the arrival of Classic Physique to our sport!

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“YOUNG GUYS ARE MORE INTERESTED IN A V-TAPER AND ABS. I PERSONALLY DON'T SEE IT AS VERY CHALLENGING OR MUCH OF AN ACHIEVEMENT, BUT THAT'S WHY WE HAVE DIFFERENT DIVISIONS. BODYBUILDING IS MUCH HARDER AND TAKES A LOT LONGER TO BE COMPETITIVE AT.” — DORIAN YATES

DORIAN YATES

Obviously, there must be a need for this new division, or it wouldn't have been created. The fact is that pro bodybuilding has gone to an extreme that many find unacceptable. The level of dissatisfaction with it isn't quite as severe as what happened with women's bodybuilding over the last decade or so, but it's definitely lost a large part of its former appeal. It's become mainly about size, and good shape and aesthetic appeal has fallen away. There are a lot of guys getting into the sport today who simply don't admire the current look and don't aspire to it, either. Back in the 1980s and even throughout the '90s, that wasn't the case. Those entering the sport did aspire to look like the champions of those eras, and found them inspiring.

Men's Physique came along a few years ago because a lot of guys wanted to be muscular, but they had no interest in weighing 250-300 pounds, or having thick, bloated midsections as many of the top pro bodybuilders were starting to. MPD was a viable option that allowed them to be muscular, yet retain a nice V-taper and a small waist. Yet, many of these guys are still bodybuilders at heart. This new Classic Physique division gives them a chance to display the whole physique, and to hit poses.

Classic Physique and MPD are more attainable to the masses. I'm sure the interest level is there among the athletes, which means more money for the organizations and the promoters. It's evolution, which I have nothing against. That being said, I have no interest in these new physique divisions. My background was hardcore bodybuilding, which was in vogue when I was growing up. Back in the 1980s, we had movie stars like Stallone in the "Rambo" movies and of course Arnold. Guys started training with the idea of getting as big as they could. But times have changed. Now, the young guys are more interested in a V-taper and abs. I personally don't see it as very challenging or much of an achievement, but that's why we have different divisions. Bodybuilding is

much harder and takes a lot longer to be competitive at.

Perhaps bodybuilding's time as the most popular division is coming to an end in the near future. If that's what's meant to be and if that's what people want, then so be it. I feel there will always be a special place and a special level of respect for bodybuilding. As for the new division, I wish it well.

Facebook: Dorian Yates

Instagram: thedorianyates

KEVIN LEVRONE

I confess I was a little confused when I first heard about this. What exactly was Classic Physique? From what I understood, Men's Physique was created in 2012 for those who didn't want to go for the bodybuilder look. If that were the case, why would there be any need to create another division for guys who weren't interested in being bodybuilders? I mean, what's the difference? But once I looked into it a little, it started to make sense.

There are plenty of men out there who love to train hard and love to build their physiques, but who have neither the genetics nor the interest in pushing their mass to extremes. For every guy out there who thinks Phil Heath and Kai Greene are the ideal physique, there are probably 10 who think that freak look is totally unappealing. To them, bodybuilding was at its pinnacle when men like Steve Reeves, Arnold and Frank Zane ruled the sport. Those physiques were all about structure, aesthetics, a rugged yet decidedly athletic look, and class. They could have been carved out of marble in Ancient

Greece. I took a look at the various weight limits, and they pretty much fall in line with that look. For example, a man of 6'2" in the new Classic Physique division can't weigh more than 232 pounds. That was Arnold in his prime. At 5'9", the weight limit is 192 pounds. Frank Zane won three Mr. Olympia titles between 1977 and 1979 with almost that exact bodyweight, ranging between 185-192.

If you haven't noticed, Men's Physique classes at the amateur level have been getting more and more crowded. You will often see 30-50 men in a class at a regional show, and far more at a national event. A lot of those men would love to do bodybuilding if it wasn't about freakish size, often at the expense of aesthetics and a small waist. I guarantee a ton of them will eagerly flock to this new division. It will allow them to really show off their hard work in the gym in a way that MPD didn't provide, especially when it comes to displaying the legs.

Bodybuilding won't be going anywhere. There will always be a certain group of men who will want to get as huge as they possibly can. To many of them, sacrificing nice shape and a dramatic V-taper is a concession they are willing to make if it means being able to step onstage at 5'9" and 250 pounds ripped, with 22-inch arms and 32-inch thighs. But there are also a lot of bodybuilders out there who don't want to look like that, or won't do what must be done to achieve that look. Classic Physique is going to give them an outlet. As for the weight limits, those might wind up being a little higher for the IFBB pros once that aspect of it is introduced. Obviously, there is still quite a bit about Classic Physique to be determined in the near future. I'm interested to watch it develop.

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Twitter: @LevroneKevin

Instagram: KEVINLEVRONE

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“THERE ARE PLENTY OF MEN OUT THERE WHO LOVE TO TRAIN HARD AND LOVE TO BUILD THEIR PHYSIQUES, BUT WHO HAVE NEITHER THE GENETICS NOR THE INTEREST IN PUSHING THEIR MASS TO EXTREMES.” — KEVIN LEVRONE



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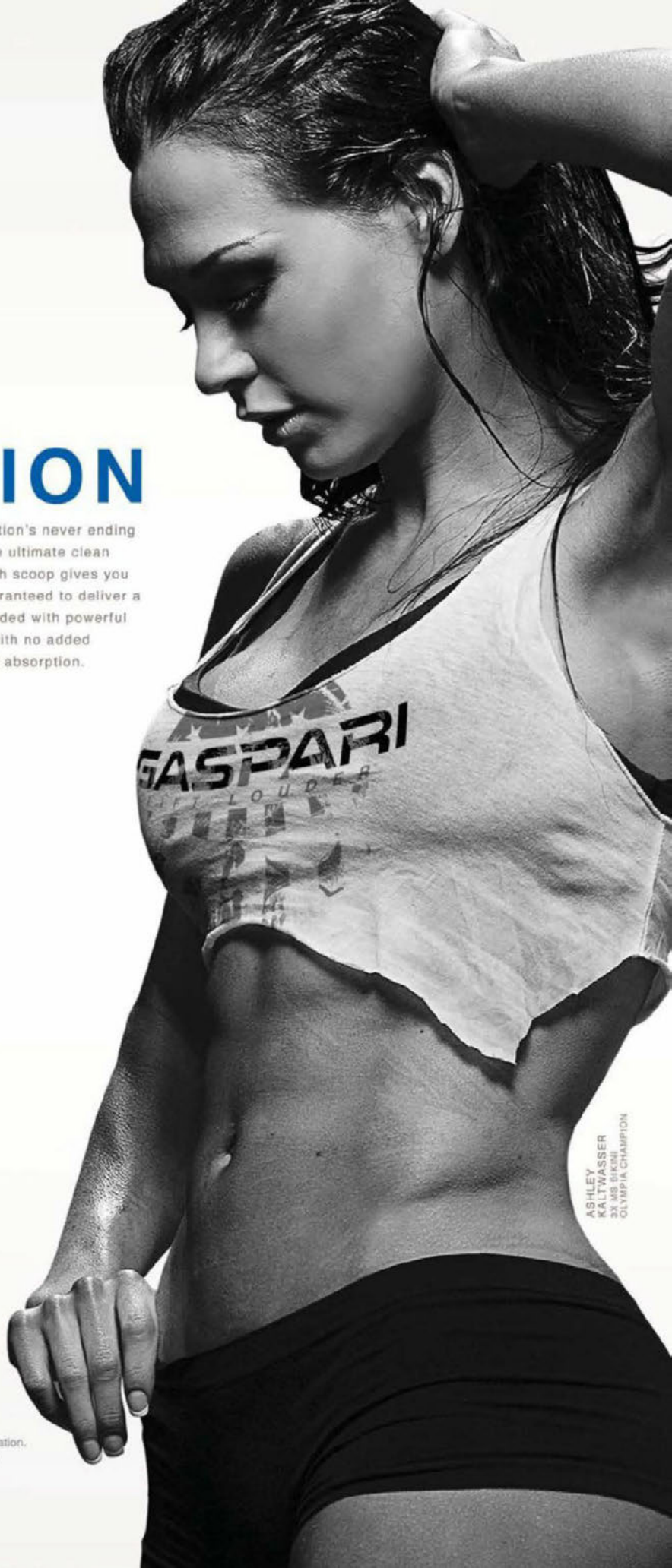
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WHAT'S IN A NAME...?

There has been lots of talk lately with the announcement of a challenger to the NPC/IFBB. Lee Thompson (former Texas State Chairman/head judge) has left the building, and is trying to establish his own company to directly challenge the longtime foothold and foundation of the house that Joe and Jim built.

Contrary to what many of you reading this right now are expecting, I'm not going trash Lee, delve into his personal life or badmouth him in any way. While I might not agree with his approach, or choice of letters from the alphabet, I actually welcome any and all to join in with competition. Without free market competition from different companies within the same arena, there would be no choices to be had for the consumer, or in this case, the competitors. When the WBF was formed by Vince McMahon back in the early '90s, it created a better landscape for the pro athletes. All of a sudden, big contracts began to appear to secure the services of the world's best, and preserve the respective company's roster.

Competition in the marketplace isn't a bad thing— unless what you're peddling is of lesser quality or lesser integrity. This is where it all falls apart. First and foremost, you need to build ANY business on a solid foundation. I have no issue with someone wanting to venture out and use their own ideas, their own brand, their own vision for the future ... hell, Jim Manion did that very thing close to 40 years ago, in the formation of the NPC (National Physique Committee). Now, you'll notice

after the three letters "NPC," I actually spelled out what it stands for. There is a good reason for this. Lee Thompson decided it was in his best interest to start his own company using the same letters, but adding "Global" after it. Bad move number one. Looking past the legalities and multitude of reasons why one shouldn't do that, let's instead look at the more generally accepted reasoning. If you want people (and potential customers) to take you seriously and give your brand a try, why create confusion with the very people you're trying to solicit for membership?

I would think using ANY other three letters would've resulted in a better reception from the bodybuilding community than what resulted. While there was certainly a fair amount of "shock and awe," there was an equal amount of outrage and support for the established company. Quite frankly, people are a lot smarter than that. Social media numbers don't accurately reflect potential business, nor does it put money in your pocket. What would you rather have ... 2 million fake Facebook "friends" or 20,000 real ones each give you \$100?

Hypothetically, if I wanted to go out on my own and start my own bodybuilding federation, the LAST thing I would want is for people to not know the difference between my new company and the one I just left. I would want absolutely NO question as to who I was, what I stood for and the changes MY company was looking to make, etc. Using an existing (and now rival) federation's initials won't endear you

to the public— it actually does the complete opposite and makes it look like a personal vendetta— not a smart business play. Both of which will bury you before even getting out of the gate.

The question I'm asked most often is, "Why is it so difficult for other companies to make any waves against the NPC/ IFBB?" The answer is simple: PRESTIGE. Athletes in any capacity ultimately love to compete. If you are going to put the time, money and effort into getting onstage, then you want to compete against the BEST, not the REST. The NPC was formed from day one as a direct avenue to the grandest stage of all: The Mr. Olympia. Over the years, the Mr. O has been expanded to include many other titles and variations of "world's best" and with it, new generations of athletes wanting to put their best against everyone else. While one may be able to get a small group together and have their own little piece of the pie, what they can't get (or purchase) is the respect that comes with being an NPC National champion or IFBB Olympian. If you want to be football player, you aspire to make it to the NFL, baseball players to the MLB, basketball players to the NBA ... Bodybuilders, Physique, Fitness, Figure and Bikini ... the IFBB.

TRUE transparency comes from running on your own label, not starting a business based on someone else's hard work and history. Misleading the public from the start will never result in them putting trust in the message you're trying to send. If you want to lead into the future, you better have a past that supports your messages.

As Shakespeare wrote: "What's in a name? That which we call a rose by any other name would smell just as sweet."

Well ... let's take a look at the two names that each federation has chosen:

Mr. OLYMPIA. The Olympics were established in Ancient Greece to celebrate a gathering of the world's best athletes every four years to determine who was the "best of the best." The Mr. Olympia was derived from that same notion back in 1965, and continues to this day.

Mr. UTOPIA. "An imagined place or state of things in which everything is perfect."

Yep.

Bob Cicherillo is off in February 2016. "Where's Bob?" will resume next month. ■

Bob Cicherillo is the IFBB Athlete Representative and one of bodybuilding's best-known personalities. He is an IFBB pro who placed first and overall as a super heavyweight in the USA Championships and first in the Masters Pro World. Bob is host of over 20 bodybuilding shows throughout the season, including the Mr. Olympia.

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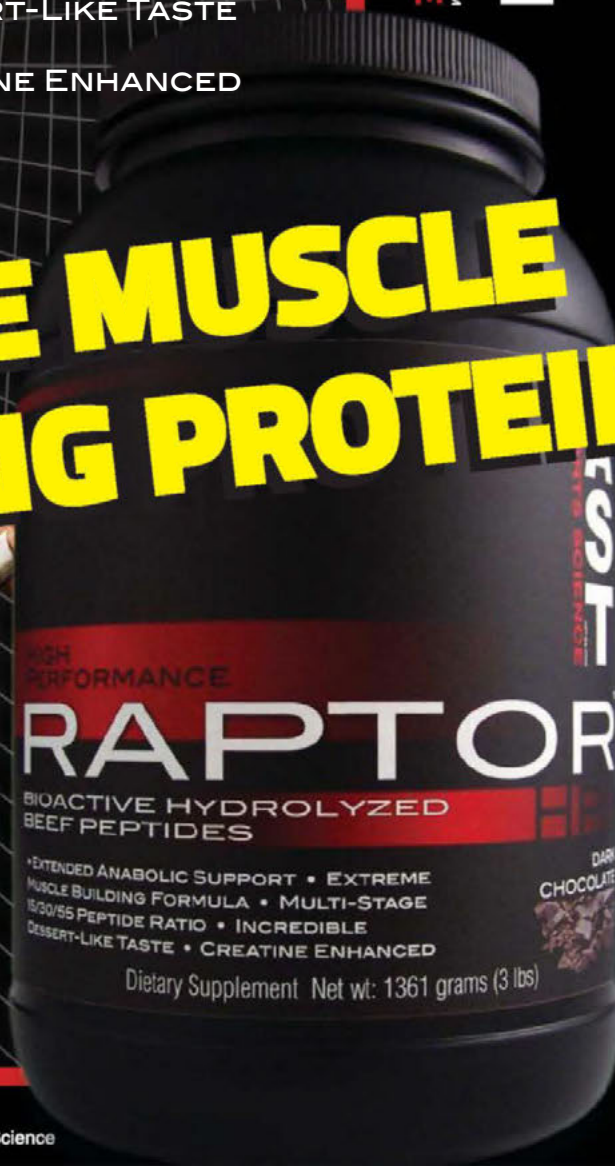
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WHO IS NUMBER TWO?

As the calendar turns to a new year, some bodybuilding fans are still trying to sort out the madness that unfolded in the latter stages of 2015, a year that delivered far more questions than answers. By winning the Mr. Olympia, Phil Heath remains the number-one bodybuilder on the planet, a distinction that accompanies his latest Olympia win. But a far more spirited and complicated debate arises when someone dares to ask, *Who's number two?*

Typically, questions like this require little thought. The second-place finisher at the Olympia is historically regarded as the second-best bodybuilder in the world. Created more than 50 years ago, the contest's purpose was to establish a clear pecking order atop the sport. I can't help but wonder if Joe Weider ever imagined a scenario where the incumbent number two simply chose not to participate, just as Kai Greene did in September.

So, what are we supposed to say when someone asks, "*Who's number two?*" Well, let's take a look at it. In one corner, there's the 46-year-old model of consistency, fresh off a remarkable showing in Vegas. **How good was Dexter Jackson?** He was good enough to steal a few first-place votes from the champ (as reflected on the scorecard). When all the scores were tabulated, Dexter was announced as the runner-up, making him the second-best bodybuilder in the world. Pretty simple, Right?? HOLD ON ... NOT SO FAST.

"WIDELY CONSIDERED HEATH'S BIGGEST THREAT, SOME WOULD ARGUE THAT KAI, ON HIS BEST DAY, IS MORE THAN DEXTER CAN HANDLE."

In the other corner is the man who placed second in each of the prior three years. Widely considered Heath's biggest threat, some would argue that Kai, on his best day, is more than Dexter can handle. Unfortunately, Kai was nowhere to be found when the Olympia head judge announced his first callout. Those highly anticipated comparisons were put on hold as fans were left to imagine what might have been.

Back to the original question ... **Who's number two?** The answer might depend on how much you enjoy delving in to the land of hypotheticals:

- *What if Kai had competed ... would he have won?*
- *What if Kai had competed ... would Dexter have been relegated to third?*
- *What if Kai had competed ... yada yada.*

Guess what? Kai didn't compete! In fact, he hasn't competed in nearly a year and a half! The last time Kai Greene participated in a posedown, the calendar still said 2014. It's been reported that he'll return to the stage in Columbus, but as it stands, the soon-to-be 41-year-old hasn't completed a contest prep since he was 39, leaving us to contemplate what MIGHT have been, giving way to an assortment of "What ifs."

Let's put this debate to rest. The second-best bodybuilder in the

world is the guy who showed up! It's the guy who put it all on the line, recently winning his 24th professional title, proving time and time again that he loves to compete, never missing an opportunity to settle a score. Dexter Jackson will go down as one of the greatest of all time ... and, make no mistake about it— **he begins 2016 as the number-two bodybuilder in the world, four years away from his 50th birthday.**

It's your move, Kai. ■



Dan Solomon is the Senior Features Editor at Muscular Development. For nearly 15 years, Dan has conducted many of the most prominent bodybuilding interviews of all time, including memorable visits with Arnold Schwarzenegger, Joe Weider and other icons of the sport. Creator of the popular "PBW Radio" program, Dan has served as moderator of the Olympia Press Conference and lead commentator at many of the world's biggest bodybuilding events. Follow Dan on Twitter @DanSolomon100 and tune in to PBW at www.MuscularDevelopment.com/pbw.

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WITH **PETER MCGOUGH**

THE 1996 ARNOLD CLASSIC

The Most Controversial Result in the Contest's History?

So here we are at the turn of the year, and as always at this time, us MD folk start to think of the launch of the 2016 bodybuilding season, which commences with the Arnold Classic in Columbus on March 5th.

In looking forward, old codgers like me indulge in a certain kind of symmetry by also looking back, and it amazes me that probably the most controversial result in the 26-year history of the Arnold Classic was all of 20 years ago (it's not only dumbbells that fly), when a seemingly "off" Kevin Levrone bested a decidedly "on" Flex Wheeler. To most competitors and pundits, Kevin came in too heavy at 252 pounds (compared to the 240 that earned the runner-up spot at the 1995



Olympia six months earlier), and Flex's sharper and harder detail looked to be a clear winner. Certainly Wheeler thought so, because as he was announced second, his eyes bulged as if he'd been the recipient of a surprise prostate examination, and large sections of the audience broke into a chorus of boos.

Twenty minutes after the result, as I made my way out of the backstage area of Veterans Memorial Hall, I espied Wheeler sitting in the empty theater with his support group. Flex doesn't wear his heart on his sleeve; he wears it pumping away like a neon sign on his forehead. He was almost in tears as he reflected on what had transpired. I told him I thought he was the clear winner. He responded: "I'm very disappointed. Kevin wasn't in shape; I was in shape. They looked for certain improvements in me from last week's Iron Man and I delivered. [Although Flex won the Iron Man, he was not at his best.] I was 230, ripped; day and night from last year's

Olympia [where he was eighth]. Kevin's a great competitor— nothing personal toward him— he just didn't hit his peak. No separation in his legs or back. He's massive, but judging is supposed to be more critical than that.

"Coming into the show, Paul [Dillet, who was third] and I figured Kevin would be the biggest threat because he had the name and was coming in on the back of his 1995 Olympia runner-up spot— we were convinced he would come in shape. Backstage, Paul and I looked at Kevin and thought, "Uh-oh, Kevin is off, the door is open." But as the prejudging went on, it was clear Kevin wasn't being looked at as if he was off. When there was just me and Kevin left, I feared the worst. He had just won the most-muscular trophy and I thought, How do you get the most-muscular when you have no definition and are not in condition? Vince [Taylor, 4th] laughed and told me, 'It's a consolation prize to Kevin 'cause he ain't gonna win the show.'"

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LEAN MUSCLE

KEVIN SHADES IT

Levrone, of course, had an entirely different take on the outcome. I duly spoke to the contest winner and the following discourse took place.

Peter McGough: The consensus is that Flex Wheeler should have won the show. Your response?

Kevin Levrone: The judges judge the contest. The reason for the dissent was the lighting. The contest was lit like an MTV special. I think the bad lighting during the prejudging worked to Flex's advantage. It favored the darker-skinned guys. The lighting was much better in the evening, and then it was clear that I was much bigger than Flex. I overpowered him. Yeah, he might have had pretty lines, but the bottom line is that he didn't have enough muscle to beat me. I don't see where he beat me. I don't see that he was harder than me. I don't think he posed better. What did you think?

PM: As soon as you walked out, it seemed clear you were holding water. You were big, but there was no separation in your legs and back like there was in Flex's.

Kevin: Maybe 'cause my skin tone was lighter, [the lighting] kinda washed me out. The game is about competing, and as the show went on, I got better while Flex's condition faded a little. It could have gone either way, but I got the nod 'cause the judges were up close and could see certain things others couldn't. I don't think I would have won the most-muscular award if I wasn't the most muscular. Who did you have first?

PM: Flex!

Kevin: Really? I was shredded and hard, but that damn lighting made everything look bad. I wanted to come into the Arnold and just blow everybody away, but now I hear all this negative stuff. To have a hundred grand and the trophy and then to hear people think you don't deserve it makes the win not worth having. For me to win the show and then pick up a magazine a month later and read stuff like "Levrone was off, his condition hadn't improved since the Olympia." That's more depressing than actually losing the damn competition. You still think Flex won?



PM: Yes.

Kevin: I was bigger and thicker than Flex. If he feels he's the better bodybuilder, then I'm doing the San Jose show [seven days afterward] and we can go do it again. I'm ready to go again, but he ain't doing a show that's just a short hop from his front door? So seriously, who do you think won the show?

PM: Flex.

Kevin: Really?

For three months afterward, Levrone would call me once every couple of weeks and ask me that same, "Who do you think won?" question. I would always answer, "Flex."

Finally, I said, "OK, Kevin, you convinced me—I've changed my mind about the result."

A buoyed Levrone enthused: "So, finally you agree I won."

"No," I answered. "I think you should have been third, with Paul Dillett second and Flex still first."

With that, the Maryland Muscle Machine (a name I gave him) told me to do something with my computer that is not only anatomically impossible, but also surely illegal in most states.

SHORT NOTES

Other memories of that contest:

• Andreas Münzer from Germany finished sixth, and a week later was seventh at the San Jose Pro won by Kevin Levrone. Five days later on Thursday, March 14, he died in a Munich hospital from a massive internal hemorrhage. His demise sent shock waves through the bodybuilding community.

• Third-placed Paul Dillett said, "Ain't no way a man looking like that should win the show. Look at me—275 pounds with striated glutes. Judging by tonight's outcome, I might as well come in at 295."

• Shawn Ray entered the event, the only time from 1992 through his career's end in 2001 when he entered a contest other than the Olympia. He wasn't at his best and finished fifth, but always ready with a quote, he commented, "Bodybuilding has gone the way of the NBA. It's a numbers game and I'm at the bottom of the barrel in terms of size. Basketball is no longer the day of the Spud Webbs and the shorter guys who really kick ass ... it's now the Shaquille O'Neals, the David Robinsons and the Hakeem Olajuwons. But I still say that when I walk off-stage, I have legions of fans who say, I like that physique."

• In finishing eighth, Porter Cottrell mused, "The day of the 205-pound bodybuilder is over."

• Making his pro debut was the 1994 World Amateur champ, Jean-Pierre Fux from Switzerland. With 280 pounds packed on his 5'11" frame, he caused a sensation, evoking thoughts of the "next Dorian." In the end he finished ninth (should have been higher), and his best Olympia finish was seventh in 1997. ■

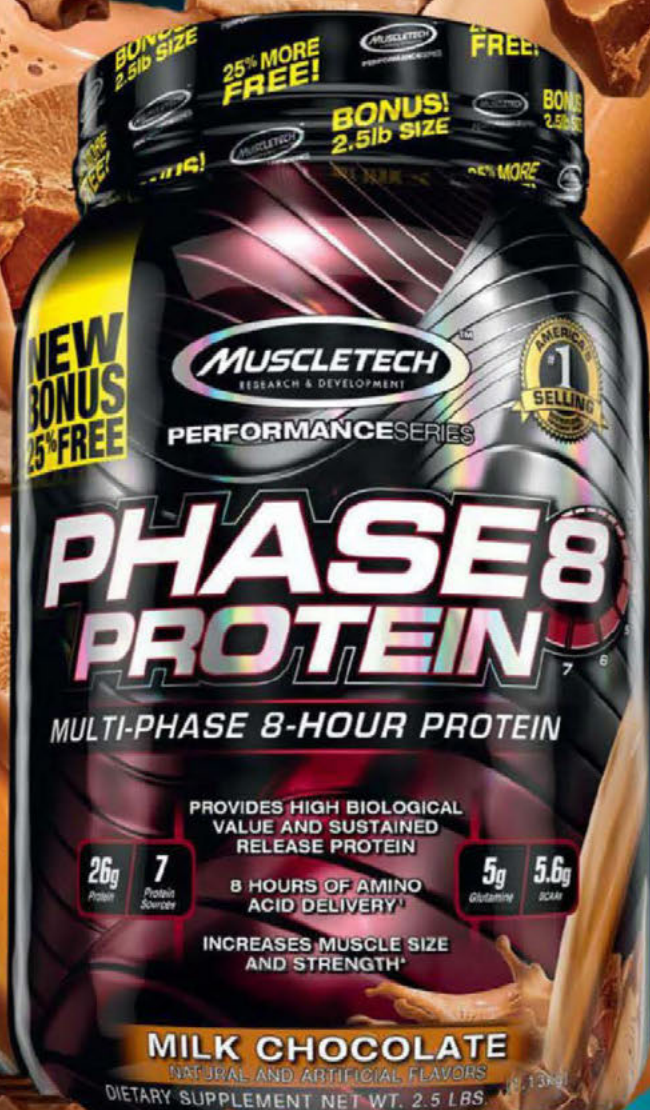


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DLB BY DANA LINN BAILEY

BUILDING LEGS: *How DLB Does It*



PER BERNAL PHOTO

I am a 25-year-old former Bikini competitor who wants to compete in WPD [Women's Physique Division]. I made that decision almost a year ago, and I am seeing good results in my upper body so far. I think I will have enough development in my back, shoulders and arms to compete next summer or fall. But my legs are still behind. They are stubborn, and I don't know what I should be doing. So far, I have been working them once a week with squats, leg presses, walking lunges, extensions and curls. I usually do three sets each for 15-20 reps. Can you please give me a routine and/or any tips on how to get my legs growing?

My first thought, before I even address your training question, is why are you skipping over Figure from Bikini and proceeding directly to Women's Physique? That's a big jump, not just in muscle size and maturity, but also in the conditioning of the muscle. I have no idea what you look like, but I know it took me at least a good four years to add the mass you would need for Women's Physique. Doing that in one year? Not saying it's impossible (because girls do it all the time), I just hope you're doing it the correct way without any supplemental enhancements, if you get my drift.

OK, so let's talk about your legs. You're working them once a week. If they are a weak area, you need to work them more often than that. I hit mine at least twice a week even now, and I'm not even getting ready for a show. During prep, I work legs every third day.

A lot of people have it in their heads that legs need a lot of time to recover, because they are such a large muscle group. I think that's overgeneralizing, because recovery is an individual thing. I find my legs actually recover quicker and also are not nearly as sore if I train them more often. You can condition yourself to do pretty much anything, and I have seen the most improvement in my legs when I train them every three days. In my case, I'm not necessarily trying to get my legs bigger at this point. I'm working more on shape and condition.

You should definitely start working your legs at least twice a week. The exercises, sets and reps that are effective will be a little different per individual and how you respond. I like to go pretty heavy on my squats, sometimes lifting more like a powerlifter with rep ranges of three to five on my working sets, but the rest of my workout is usually high rep ranges, anywhere from 15 to 30, with drop sets and supersets or anything I can throw at them to respond.

"A LOT OF PEOPLE HAVE IT IN THEIR HEADS THAT LEGS NEED A LOT OF TIME TO RECOVER, BECAUSE THEY ARE SUCH A LARGE MUSCLE GROUP. I THINK THAT'S OVERGENERALIZING, BECAUSE RECOVERY IS AN INDIVIDUAL THING."

“SWITCHING THINGS UP IS IMPORTANT. I FIND THAT AS TIME GOES BY, I HAVE TO COME UP WITH KOOKIER METHODS TO KEEP SEEING RESULTS.”

Legs are a very resilient body part. You use them all day to walk, climb stairs, do cardio, etc. Straight sets aren't going to be as productive for legs as they are for other body parts. Also, I am not sure what you mean when you say they are behind. Do you mean in size? Or conditioning? Or both? Because that will also determine a little bit how you need to train them. So let's just assume you mean both size and conditioning. Generally, my rule of thumb if you are looking to increase size, is to recommend heavier weight with a rep scheme anywhere from three to 10 reps. Now for conditioning, I like using a higher rep scheme, usually around 15 to 20, which you already do. Conditioning also takes time, so give yourself an adequate amount of weeks of prep before a show. Slow and steady always wins the race.

As far as what your workout should look like, change it up! It doesn't need to look the same every time. You have to throw a lot of different things at them: heavy weight, moderate



weight, high reps, supersets, drop sets, negatives, partials, all kinds of crazy stuff if you want them to respond. Legs have a lot of endurance. Typically, just doing three sets of something isn't sufficient. I usually do a warm-up set and then five work sets per exercise, and I'm also not afraid to do even more than that. Switching things up is important, too. I find that as time goes by, I have to come up with kookier methods to keep seeing results. Trying to get stronger is one way to keep progress coming, but you also need to continue increasing intensity. That's where the supersets, drop sets and other techniques come in.

One final tip about these leg workouts is to alternate starting with quads or hams. The hams often lag behind the quads, because so many people work them after quads at all their leg workouts. Make sure you give your hams priority by working them first at every other leg workout.

Check out my Olympia and Arnold Classic training journals on www.danalinbailey.com to give you some ideas and inspire your own workouts!

UNEXPECTED FUNK AFTER A SHOW

How do you cope with post-show blues, as your body tries to get back to normal and your mind struggles with not being so lean anymore? What do you do? Do you set new goals? What do you eat? How do you stay motivated once the contest is over?

I think this is something that is not talked about nearly enough. The preparation, excitement and anticipation that come with competition can many times lead to an unexpected funk. You have been so focused these last couple of months on not missing one fasted-cardio session, annihilating every workout, weighing every morsel of food and calculating your water like a complete maniac. So now, what do you do when it is all over? You no longer have to jump right on the StepMill as soon as your eyes open in the morning. You have no deadlines. You can realistically do anything you want today without a care in the world, because you have no obligations, no restrictions and no requirements anymore. But somehow, even though that sounds so wonderful, you suddenly feel empty, almost lost, with no real direction anymore. You are depressed, and you have no idea why.

Post-competition depression is a very real thing, and it can make anyone spiral out of control and sabotage all that hard work and progress from the last couple of months. The following are some tips and strategies to help combat post-show depression.

1. BE REALISTIC

First and foremost, you need to be real with yourself. You cannot look the way you look onstage all year round. It is not realistic and it isn't healthy. That doesn't mean gaining 30 pounds after a show is OK, either, because that is also very unhealthy for your body to drastically change so fast.

2. PREPARE YOURSELF MENTALLY

You need to acknowledge that you will gain some weight after a show. After depleting and dehydrating, your body will be very sensitive. Do not just start chugging water or eating everything in sight after you get offstage. You can easily end up in the hospital (no joke!). After competing, you will have water retention. You will feel bloated. You will get softer. That shredded physique that you trained and dieted so hard for these last three to four months will fade in a week. And you need to just know that it's going to happen, accept it and prepare yourself mentally. How much it fades away is up to you and the choices you make the week after.

3. TAKE A F**KING BREAK

Take a break from the gym and a break from the clockwork diet. As much as you actually may want to go to the gym or do cardio, or feel obligated/brainwashed to, don't! Take a f**king break! I know it seems weird, but seriously, quit being so obsessive and take a couple of days off to relax. Your adrenal glands have been working overtime these last couple of months. These glands are responsible for releasing hormones like cortisol that kick in when you're stressed. Adrenal fatigue can occur after long periods of



“DON'T LET THE COMPETITION OWN YOUR LIFE. TRY NOT TO OBSESS OVER HOW YOU LOOK. THERE IS MORE TO LIFE THAN BEING 'SHREDDED,' AND THAT'S HAPPINESS.”

stress, like competition prep. So you need to give your body a break in order to restore your system.

I am not saying you need to take weeks off, but I would suggest taking two to three days off completely, maybe do some light cardio if anything. Then slowly get back to your workout regimen. If you were doing cardio every day for 40 minutes, maybe do it every other day, or lower the time. Diet is a little trickier, but you can relax with that too. Usually I enjoy myself the day after, but then get on a diet regimen with scheduled “cheats” so I do not go too overboard. You need to slowly reintroduce carbs and fats back into your diet.

4. TRY SOMETHING NEW

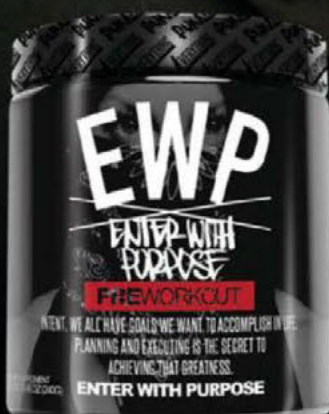
Experiment with other types of training. Instead of using the dreadful StepMill for cardio, maybe be more adventurous and go hiking, biking, swimming or maybe some one-on-one basketball. Experiment with your workouts. Try a different style of training, like CrossFit, or circuit training, or maybe try a group class. Maybe even pursue something else and train for that. Just because you compete in bodybuilding doesn't mean you can't compete in anything else. You can look beyond bodybuilding. Try out obstacle racing, or train for strength and try powerlifting, sign up for a 5K run, or maybe even “America Ninja Warrior”!

The bottom line is, don't let the competition own your life. Try not to obsess over how you look. There is more to life than being “shredded,” and that's happiness.

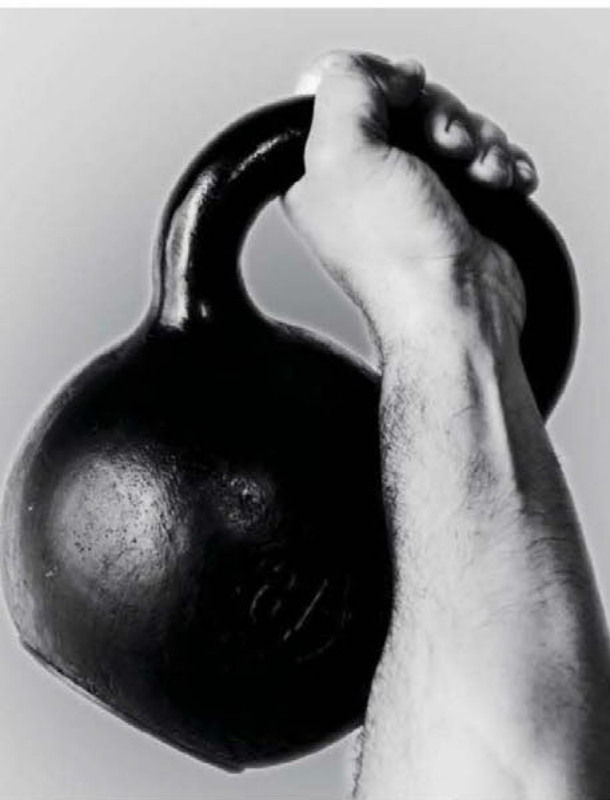
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KETTLEBELL ROUTINE COULD DEVELOP ENDURANCE AND STRENGTH

THE PHYSIOLOGICAL RESPONSES TO A HIGH-INTENSITY, KETTLEBELL INTERVAL TRAINING ROUTINE DEVELOPED BY BRIAN WILLIAMS AND ROBERT KRAEMER FROM SOUTHEASTERN LOUISIANA UNIVERSITY SHOULD BUILD ENDURANCE AND STRENGTH. The routine is a 12-minute kettlebell workout that uses a Tabata regimen—repetitions of 20 seconds of kettlebell exercises followed by 10 seconds of rest. The kettlebell exercises in the circuit were the sumo squat, swing, one-arm clean and press, and sumo deadlift. The responses to the kettlebell circuit were similar to a time-matched, interval-training workout on a stationary bike. Caloric expenditure and heart rate were similar between workouts. The study expanded our view of high-intensity exercise. A high-intensity kettlebell circuit can substitute for high-intensity interval training workouts on a stationary bike or elliptical trainer. (Journal Strength and Conditioning Research, 29: 3317-3325, 2015)

HIIT BENEFITS EQUAL TO MODERATE-INTENSITY TRAINING

LESS IS MORE WHEN IT COMES TO HIGH-INTENSITY TRAINING—ACCORDING TO A STUDY LED BY GORDON FISHER FROM THE UNIVERSITY OF ALABAMA AT BIRMINGHAM. Six weeks of high-intensity interval training (HIIT) or moderate-intensity training (MIT) in overweight, college-aged men produced equal improvements in body composition and heart disease risk factors. MIT triggered greater changes in aerobic capacity but HIIT caused greater increases in power output, indicating that HIIT produced greater improvements in functional fitness. HIIT involved four sets of 30 seconds of intense exercise plus rest on a stationary bike (20 minutes total), while MIT involved 45 to 60 minutes of stationary cycling at 55 to 65 percent of maximum effort. Both forms of exercise produced positive changes in fitness, body composition and heart disease risk factors. HIIT produced the changes in half the time, but at higher exercise intensities. (PLOS ONE, 10(10): e0138853, 2015)

Heat or Cold for Post-Exercise Pain

HEAT OR COLD CAN REDUCE POST-EXERCISE MUSCLE PAIN—ACCORDING TO A STUDY LED BY JERROLD PETROFSKY FROM LOMA LINDA UNIVERSITY, AND CO-WORKERS. Intense weight training, particularly involving eccentric muscle contractions (lengthening contractions), can trigger delayed-onset muscle soreness (DOMS). Examples of DOMS-producing exercises include negatives, almost any free-weight exercise and downhill running or hiking. Small ruptures in the muscle tissue, which releases calcium and triggers an inflammatory response that promotes healing, cause it. Muscle soreness and stiffness gets worse for several days before it subsides. DOMS decreases performance and makes it difficult to train for several days. In the study, 100 test subjects performed squats for 15 minutes. Heat or cold was applied immediately after exercise or after 24 hours. Heat or cold promoted strength recovery compared to no treatment. Cold was superior to heat for reducing pain. Researchers concluded that heat or cold could prevent post-exercise pain and muscle damage. Other studies have questioned the use of cold for injured muscles because cold decreases inflammation, which is critical for tissue repair. (Journal Strength and Conditioning, 29: 3245-3252, 2015)

HEAVY LOAD TRAINING FOR MAX STRENGTH

MORE THAN 200,000 PEOPLE HAVE WATCHED THE VIDEO OF LEGENDARY BODYBUILDER RONNIE COLEMAN DOING 10 EASY REPS IN THE DUMBBELL BENCH WITH 200 POUNDS IN EACH HAND ([HTTPS://WWW.YOUTUBE.COM/WATCH?V=WKUTSGXBTCE](https://www.youtube.com/watch?v=WKUTSGXBTCE)). That's serious horsepower! Many bodybuilders train with light weights to failure, but can they achieve the incredible size and strength of Ronnie? The results of a study led by Brad Schoenfeld from CUNY Lehman College in New York suggest that high-load training produces greater strength than low-load training, and both methods build muscle mass equally. Researchers compared changes in strength and muscle mass during an eight-week program in young men performing 25 to 35 reps per set per exercise (low load training, LL) versus eight to 12 reps per exercise (heavy load training, HL) for three sets of seven exercises. Both methods produced similar changes in muscle mass but HL triggered greater increases in strength. Muscle endurance was greatest with LL training. Training heavy is best for building strength and mass. (Journal Strength Conditioning Research, 29: 2954-2963, 2015)



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OLYMPIC SHOT-PUTTING LEGEND BRIAN OLDFIELD'S FAVORITE MOTTO IS, "NOBODY IS COMPLETELY WORTHLESS; THEY CAN ALWAYS SERVE AS THE BAD EXAMPLE." A study led by TaeHo Kim from Yonsei University Wonju College of Medicine in Korea is a bad example of a scientific paper in exercise physiology. In the introduction, the authors discussed the value of walking as a beneficial exercise for preventing obesity, high blood pressure, type 2 diabetes and premature death. Then they presented data on physiological changes during a 100-kilometer (62 miles) walk, which is not typical of recreational walkers. For some reason, they examined IGF-1 and IGF-binding protein, which are important in protein and fat metabolism. The walk caused extreme biological stress, as suggested by large changes in liver enzymes, blood sugar and blood fats. Plasma volume (blood liquid) decreases by 15 to 20 percent during such arduous exercise, which concentrates blood chemistry values. The researchers didn't measure plasma volume, so their blood chemistry values are worthless. This could have been an interesting study, had they developed well-formed hypotheses and used appropriate methods. Studies like these help explain the disdain many people have for scientific research. (*Journal of Lifestyle Medicine*, 5: 21-25, 2015)

FORCED REPS FOR GREATER MUSCLE GROWTH

MUSCLES GROW IN RESPONSE TO TIME UNDER TENSION, METABOLIC STRESS AND MUSCLE DAMAGE. Australian researchers Daniel Hackett and Theban Amirthalingam explained how forced reps could take athletes to the next level of intensity in their programs. The technique involves assistance with additional reps after the lifter has reached momentary muscular failure. Assistance might vary from the "magic fingers" (spotter puts fingers on the bar and the lifter "magically" completes the rep) to significant assistance, where the spotter does much of the work. Unfortunately, few studies have examined the effects of forced reps on muscle mass and strength. The technique increases the risk of overtraining and overuse injury. Strength guru Dan John, chosen by JMax Fitness as the most influential fitness professional in America, says, "Everything works." Forced reps overload the muscles, so they will promote muscle mass and strength. Like any training method, don't overdo it. (*Strength and Conditioning Journal*, 37(5): 14-20, 2015)



REST MORE BETWEEN SETS WHEN BENCHING HEAVY

LIFT HEAVY TO PRODUCE BIG SINGLES IN POWERLIFTING AND WEIGHTLIFTING EXERCISES. Many bodybuilders rest one minute or less when performing high-rep sets of eight to 15 reps. Rest longer for heavy sets—according to the results of a study led by Estevão Scudese from Rio de Janeiro Federal University in Brazil. Researchers studied the effects of resting one, two, three or five minutes between consecutive bench press sets at three-repetition maximum. Athletes completed more repetitions resting two, three or five minutes between sets compared to one minute. Resting five minutes caused the greatest decrease in perceived exertion. Resting two minutes between sets produces the most time-efficient results when benching heavy, but longer rest periods will make you feel better. (*Journal Strength Conditioning Research*, 29: 3079-3083, 2015)



Low-Intensity Interval Training With Blood Flow Restriction Increases Aerobic Capacity and Strength

WEIGHT TRAINING WITH LOW LOADS AND RESTRICTED BLOOD FLOW, A TECHNIQUE CALLED KAATSU TRAINING, INCREASES STRENGTH AND IS PARTICULARLY VALUABLE DURING REHABILITATION. A study led by Mariana Oliveira from the Federal University of Santa Catarina in Brazil found that four weeks of low-intensity interval training (30 percent of max) on a stationary bike combined with blood flow restriction increased aerobic capacity, power output and knee extension strength. Other groups in the study practicing high-intensity interval training (100 percent max) with and without blood flow restriction increased aerobic capacity but not strength. Interval repetitions increased progressively during the four-week study from 10 x 120 seconds to 16 x 120 seconds with 60 seconds of rest between intervals. Researchers restricted blood flow with large cuffs on each thigh inflated to 180 millimeters of mercury. The study used relatively untrained college-aged students, so it is not clear whether this technique will work with well-trained athletes. (*Scandinavian Journal of Medicine & Science in Sports*, published online September 15, 2015)



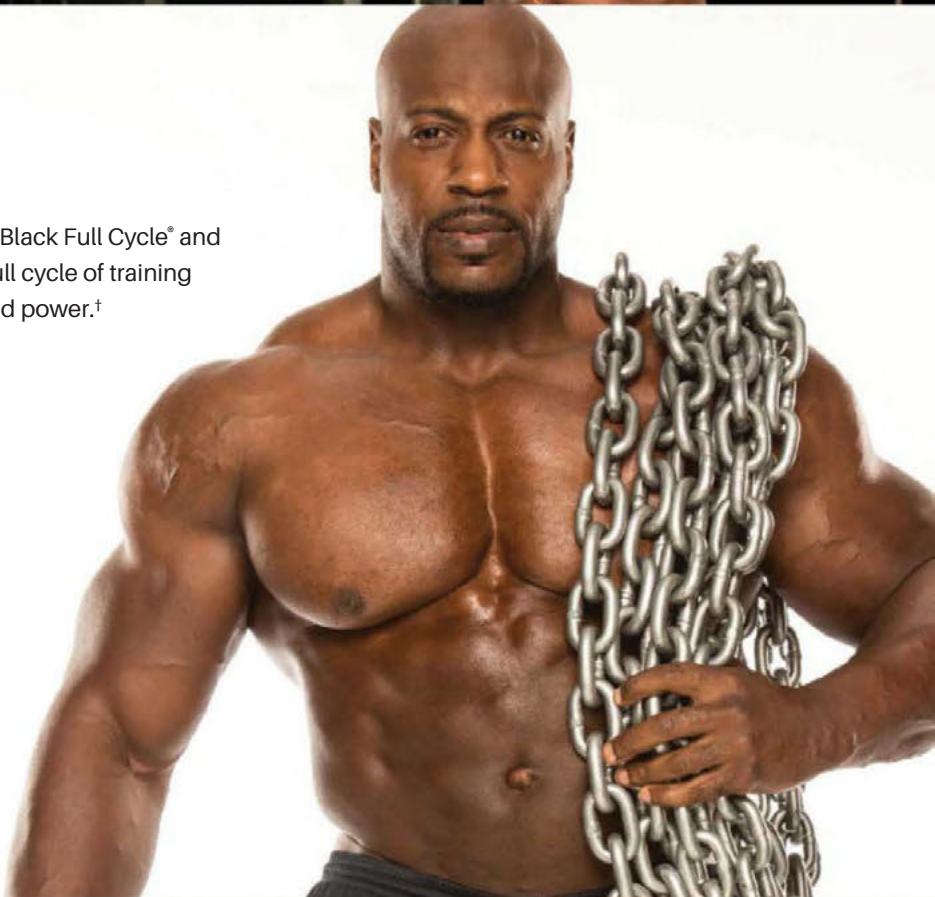
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Dairy Foods But Not Calcium Supplements Promote Fat Loss

SEVERAL LARGE POPULATION STUDIES FOUND THAT DAIRY FOOD CONSUMPTION WAS LINKED TO LOWER BODY FAT. As expected, the dairy industry jumped on these findings to promote their products. These studies didn't find that eating more dairy foods will make people thinner—only that dairy consumption is related to lower body fat. Alison Booth and colleagues from Deakin University in Australia performed a meta-analysis that pooled the results of studies on the effects of dairy consumption and calcium supplements on bodyweight and body composition. Calcium supplements had no effect on weight or fat loss. Dairy consumption as part of a reduced-calorie diet, on the other hand, caused fat loss but not weight loss. The researchers concluded that in the short term (four months), including three daily servings of dairy might promote fat loss. (British Journal Nutrition, 114: 1013-1025, 2015)

HIGH-INTENSITY INTERVAL TRAINING PROMOTES APPETITE CONTROL

HIGH-INTENSITY INTERVAL TRAINING (HIIT) INVOLVES REPEATED REPETITIONS OF HIGH-INTENSITY EXERCISE LASTING 10 TO 120 SECONDS, FOLLOWED BY REST OR REDUCED EXERCISE INTENSITY. HIIT produces rapid improvements in endurance, maximal oxygen consumption, glycogen storage and muscle cell mitochondria (cell powerhouses) in less time than traditional exercise training. Its effects on obesity and weight control are not totally understood. Aaron Sim and colleagues from the University of Western Australia found that HIIT practiced for 12 weeks reduced appetite in overweight, inactive men better than continuous exercise.

The HIIT program consisted of repeated bouts of exercise on a stationary bike for 15 seconds at maximum intensity, followed by one minute of rest. Traditional training involved 30 to 45 minutes of continuous exercise on a stationary bike at 60 percent effort. Appetite was assessed during test meals. The HIIT group showed improvements in appetite regulation during the test meals, while there were no changes in the traditional exercise group or controls. HIIT also improved blood sugar regulation. HIIT is a good training method for weight control and management of insulin sensitivity. (Medicine Science Sports Exercise, 47: 2441-2449, 2015)



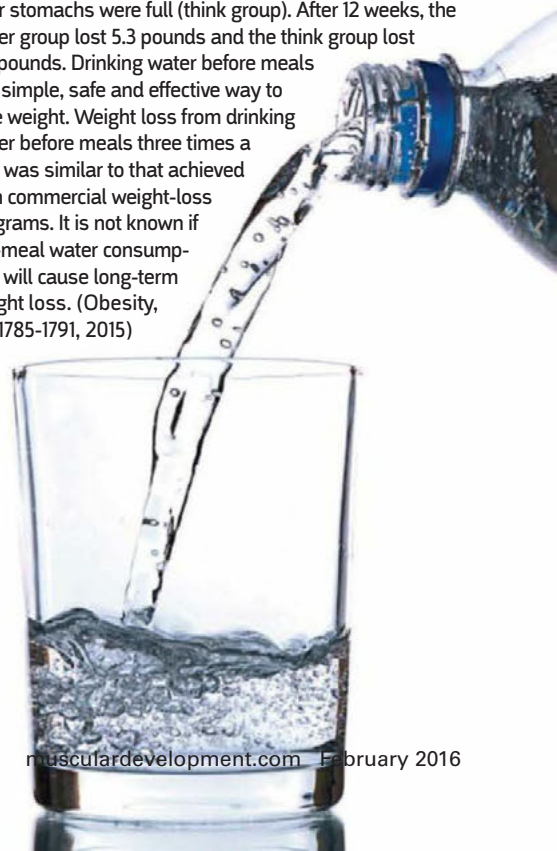
DRINKING WATER BEFORE MEALS Promotes Weight Loss

AN EASY WAY TO LOSE WEIGHT IS TO DRINK A PINT OF WATER BEFORE MAJOR MEALS—ACCORDING TO A STUDY LED BY HELEN PARRETTI FROM OXFORD UNIVERSITY IN THE U.K. Thirty minutes before each major meal, people drank a pint of water (water group) or imagined their stomachs were full (think group). After 12 weeks, the water group lost 5.3 pounds and the think group lost 2.6 pounds. Drinking water before meals is a simple, safe and effective way to lose weight. Weight loss from drinking water before meals three times a day was similar to that achieved with commercial weight-loss programs. It is not known if pre-meal water consumption will cause long-term weight loss. (Obesity, 23: 1785-1791, 2015)



Regular Exercise Maintains Daily Caloric Expenditure After Weight Loss

MORE THAN 66 PERCENT OF AMERICANS ARE OBESE OR OVERWEIGHT. OBESITY INCREASES THE RISK OF HEART DISEASE, STROKE, BACK PAIN, POOR METABOLIC HEALTH AND PREMATURE DEATH. A recent Gallup poll found that 51 percent of Americans want to lose weight, while only 26 percent are making a serious effort to do so. Weight maintenance is extremely difficult. Ninety-five percent of people who lose weight will gain it back again within a year. One reason for this is that metabolic rate slows after weight loss, making it extremely difficult to maintain the losses. An important study led by Gary Hunter from the University of Alabama at Birmingham showed that aerobic or resistance exercise helps maintain metabolic rate after weight loss. Researchers studied physically inactive, obese middle-aged women who lost an average of 25 pounds. One group did aerobics, another group lifted weights, while another was sedentary. The exercise groups, particularly the resistance trainers, were able to maintain metabolic rate (calorie burning) after weight loss, which is extremely important for preventing weight regain. (Medicine Science Sports Exercise, 47: 1950-1957, 2015)



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MELATONIN HELPS CUT FAT

MELATONIN IS A HORMONE PRODUCED BY THE PINEAL GLAND IN THE BRAIN THAT PROMOTES SLEEP. IT IS PRODUCED CYCLICALLY IN RESPONSE TO DARKNESS AND LIGHT. Supplementing melatonin might promote weight control—according to the results of a study on mice by Italian researchers. Lean and obese mice were given melatonin or a placebo in their drinking water for eight weeks. Melatonin reduced weight, fat storage area and reversed fat tissue enlargement in the obese mice, but not the lean mice. It worked by decreasing inflammation and normalizing adipokines, which are important fat-signaling chemicals. It also activated brown fat and enhanced energy expenditure. Melatonin supplements help promote sleep and weight control. (Nutrition Research, 35: 891-900, 2015)



BILE DUCT DIVERSION MIGHT BE SUPERIOR TO GASTRIC BYPASS FOR WEIGHT LOSS

BARIATRIC SURGERY (WEIGHT-LOSS SURGERY) IS PERFORMED ON OBESE PATIENTS WITH A BODY MASS INDEX OF AT LEAST 40 KILOGRAMS PER SQUARE METER, WHO ARE SEEKING SIGNIFICANT WEIGHT LOSS. The Roux-en-Y gastric bypass and sleeve gastrectomy are the most popular surgeries. These procedures have frequent complications such as bloating and diarrhea, infections, gallstones, nutritional deficiencies and pneumonia. Charles Flynn and colleagues from the department of surgery at Vanderbilt University Medical Center, in a study on obese mice, investigated diversion of the bile duct to the end of the small intestine as a way of promoting weight loss. The animals lost weight, reduced blood sugar and fats, and increased energy expenditure. Gut microbes resembled those of lean mice following the surgery. Bile duct diversion is a simpler procedure than gastric bypass that has fewer metabolic complications. It is not yet available in humans. (Nature Communications, published only July 21, 2015)

LOW-FAT DIETS DON'T WORK

DURING THE PAST 35 YEARS, NUTRITIONAL EXPERTS HAVE ADVISED PEOPLE TO CUT DOWN THE AMOUNT OF FATS THEY CONSUME. The origin of this recommendation was the United States Senate Select Committee on Nutrition and Human Needs Committee chaired by former U.S. Senator George McGovern (1968 and 1977). This productive committee established reduced intake of fats and increased consumption of carbohydrates as national goals. Americans took this advice to heart, and obesity rates went through the stratosphere. Deirdre Tobias and co-workers from Brigham and Women's Hospital and Harvard University conducted a meta-analysis that pooled the results of 53 randomized trials on the effects of low-fat diets on long-term weight loss. Low-fat diets do not cause more weight loss than diets higher in fat. Fat has been demonized for nearly half a century, based more on political considerations than scientific fact. (The Lancet Diabetes & Endocrinology, 3: 968-979, 2015)

Intermittent Fasting for Weight Loss

SUCCESS IN MANY SPORTS REQUIRES MINIMAL BODY FAT AND MAXIMAL MUSCLE MASS. INTERMITTENT FASTING MIGHT HELP ATHLETES ACHIEVE THIS GOAL—ACCORDING TO AN ARTICLE BY GRANT TINSLEY, JOSHUA GANN AND PAUL LA BOUNTY. Athletes must make weight in sports like weightlifting, powerlifting and martial arts. Constant dieting can sap energy and trigger glycogen depletion in the muscles and liver, which makes it difficult to train hard. Intermittent fasting, involving periods of fasting and non-fasting, might help athletes lose weight and maintain energy for intense training. Fasting every other day or even once a week results in a calorie deficit over time that promotes fat loss. Modified fasting allows athletes to consume some calories, which might be more realistic and palatable. Short fasts are best for athletes because they don't cause significant muscle loss. Athletes can fast on non-exercise days so they have plenty of energy for physical activity. We don't completely understand how intermittent fasting affects performance. (Strength and Conditioning Journal, 37: 60-71, 2015)



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MEN CONCERNED ABOUT BODY IMAGE

SEVENTY-FIVE PERCENT OF WOMEN DON'T LIKE THE WAY THEY LOOK IN THE NUDE. That's true even among women with terrific bodies. Consequently, sixty-five percent have behavioral issues regarding food intake and 10 percent have eating disorders such as anorexia, bulimia nervosa and binge-eating disorder. Men of the "selfie generation" are also concerned about body image. The popularity of superheroes has given modern men inferiority complexes because Superman and Batman don't have potbellies. The modern male's obsession with body image has led to previously rare psychological problems such as depression and muscle dimorphism (obsessed with muscle mass). While eating disorders are rare in men, millennials are resorting to anabolic steroids, plastic surgery and makeup to make them feel better about themselves. The modern emphasis on gender equity has caused many modern young men to question their masculinity. Most women have no trouble talking about their insecurities, but men tend to hide them. Feelings of physical inadequacy are new psychological challenges for modern men. (Nature, 526: S12-S13, 2015)

Weight Training Prevents Brain Deterioration

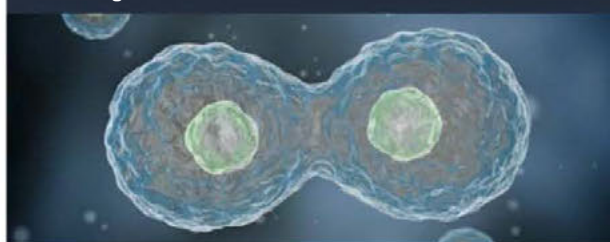
WEIGHT TRAINING REDUCED THE INCIDENCE OF BRAIN INJURIES (WHITE MATTER LESIONS) IN OLDER WOMEN— ACCORDING TO A ONE-YEAR STUDY BY CANADIAN RESEARCHERS. Exercise is the new "brain food." Even moderate physical activity can improve brain health and function, and may delay the decline in cognitive function that occurs in many people as they age. Exercise improves the brain's ability to learn, remember, think and reason. It promotes the creation of new nerve cells throughout the nervous system and enhances the nervous system's plasticity— its ability to change and adapt. Exercise protects the brain as people age, helping to delay or prevent brain disorders such as Alzheimer's disease. Exercise is the true Fountain of Youth. (Journal American Geriatrics Society, 63: 2052-2060, 2015)

HIIT IMPROVES BLOOD SUGAR REGULATION

HIGH INTENSITY INTERVAL TRAINING (HIIT) IMPROVES BLOOD SUGAR REGULATION AND PREVENTS TYPE 2 DIABETES— ACCORDING TO A LARGE META-ANALYSIS BY RESEARCHERS FROM GREAT BRITAIN. HIIT involves repetitions of high-intensity exercise lasting 10 seconds to several minutes, followed by rest. The analysis combined the results of 50 studies. HIIT reduced insulin resistance, hemoglobin A1c and bodyweight more than continuous exercise or inactivity in people with and without type 2 diabetes. HIIT produces rapid increases in fitness and improves blood sugar regulation. (Obesity Reviews, 16: 942-961, 2015)

How to Live Longer

MAXIMUM LIFE SPAN IS DETERMINED BY THE NUMBER OF TIMES CELLS CAN DIVIDE. Molecular biologists usually use worms and fruit flies to study cell aging and death because these organisms don't live very long. The key to longer cell life is to reduce signaling from insulin and insulin-like growth factors, which are anabolic hormones. If these results apply to humans, the key to a longer life is to avoid high-sugar diets, prevent obesity and exercise regularly. In short-living animals, decreasing caloric intake increases the life span by about 25 percent. This is not practical in humans. However, positive metabolic changes occur in response to occasional fasting. The longest verified living human was Jeanne Calment (1875-1997), who lived 122 years. Life expectancy has increased consistently during the past century, largely because of a decrease in infant mortality. But, the maximum life span hasn't changed much. People like Ben Franklin, Thomas Jefferson and Michelangelo lived long lives, even though the average life span was only 30 to 40 years. Scientists are actively studying techniques that will expand the human cell life span. We should live so long. (Nature, 524: 170-171, 2015)



STRONGER QUADS LINKED TO REDUCED DEATH RISK

STRONG QUADRICEPS ARE LINKED TO A LOWER RISK OF PREMATURE DEATH FROM CARDIOVASCULAR DISEASE AND FROM ALL CAUSES— according to a study led by Kentaro Kamiya from Kitasato University Hospital in Japan. Researchers measured quad strength in 1,314 aging men and performed follow-up measurements five years later. Stronger men showed an 88 percent lower risk of death from cardiovascular disease and a 75 percent reduced risk from all causes, compared to men with the least quad strength. Regular exercise is critical for a long life. Poor leg strength promotes exercise intolerance, which deprives people of an easy and effective way of maintaining metabolic health. (The American Journal of Medicine, 128:1212-1219, 2015)



Exercise Slows the Aging Process

PHYSICALLY FIT PEOPLE HAVE HEALTHIER, MORE RESILIENT GENES. Exercise preserves gene structures called telomeres, which form the ends of the DNA strands and hold them together. Over time, the telomeres shorten, reducing their effectiveness, which triggers illness and death. Exercise prevents telomere shortening. A study led by Nobel Prize-winner Elizabeth Blackburn from the University of California, San Francisco and Paul LOPrinzi from the University of Mississippi showed that people who exercised more had longer telomeres (leukocyte telomeres). The relationship was strongest during middle-aged people (40-64), which suggests that this is a critical time for remaining active. Other studies have found that overtraining shortens telomere length, so balance is the key. (Medicine Science Sports Exercise, 47: 2347-2352, 2015)

Excessive Exercise Linked to Coronary Atherosclerosis

THIS MONTH, WE SUMMARIZED SEVERAL STUDIES SHOWING THE HEALTH BENEFITS OF EXERCISE. Excessive exercise, however, can cause hardening of the arteries in the heart and increase the risk of heart attack— according to a study presented by British scientists. They studied 169 veteran competitive endurance athletes and compared them with aged-matched non-athletes. Athletes who ran more than 35 miles a week or cycled more than 150 kilometers per week had greater coronary artery calcium accumulation. Fahey and Swanson (Med Sport, 12 (4): 124-128, 2008), in an analysis of 20,000 subjects from the Physicians' Health Study, predicted that 30 minutes of exercise was best for avoiding sudden cardiac death. People who exercised more or less than that were at increased risk. As Goldilocks could tell you, just as there's an optimal temperature for porridge, there is an optimal volume of endurance exercise that promotes health. (European Society of Cardiology meeting, August 2015)

Weight Training Reduces the Risk of Type 2 Diabetes

WEIGHT TRAINING WAS LINKED TO A 42 PERCENT LOWER RISK OF TYPE 2 DIABETES— ACCORDING TO A STUDY FROM THE NATIONAL CENTER FOR GLOBAL HEALTH AND MEDICINE IN TOKYO, JAPAN. Researchers measured blood sugar and hemoglobin A1c (a measure of blood sugar control) in 26,630 middle-aged and older men and women with no evidence of type 2 diabetes, and followed-up five years later. Non-weight trainers showed a marked decrease in blood sugar control compared to people who weight trained. The effects were greatest in people over 50. Muscle tissue is an important site for blood sugar regulation. Avoiding muscle loss through weight training is an important way of preventing insulin resistance and type 2 diabetes. (Journal Diabetes Investigation, 6: 655-661, 2015)

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PROCESSED FOODS MAY BE ADDICTIVE

MANY PEOPLE HAVE PROBLEMS WITH BINGE EATING—THEY GORGE ON FOOD LONG AFTER THEY STOP FEELING HUNGRY. Erica Schulte from the University of Michigan, and co-workers, found that some processed foods might be addictive like heroine because they contain concentrated calories that are absorbed rapidly. Addictive foods were high in fat and had a high glycemic load (caused greatest increases in total blood sugar). Foods presenting the greatest risk of addiction included chocolate, ice cream, french fries, pizza, cookies, chips, buttered popcorn, cheeseburgers and muffins. Foods with the lowest potential for addiction included beans (no sauce), broccoli, cucumber, water (not a food), brown rice, carrots and bananas. Food addiction was most significant in people experiencing the greatest spikes in blood sugar. (PLOS ONE, 10(2): e0117959, 2015)

Should You Stop Eating Bacon and Hot Dogs?

THE WORLD HEALTH ORGANIZATION FOUND A LINK BETWEEN PROCESSED RED MEAT CONSUMPTION AND COLORECTAL CANCER. Eating processed meats increased the risk by 17 percent. The cancer-causing chemical in processed meat appears to be heme iron, which has been discovered in cancerous tissue. The link might also be the way bacteria in the gut reacts to the meat products. That doesn't mean you should give up hot dogs, bologna and bacon, because the link was small. The risk of colon cancer from bacon pales in comparison with the risk of not getting a colonoscopy at age 50 to 75, or smoking. Processed meat causes about three percent of all cancer. In contrast, tobacco causes 86 percent of lung cancers. America would have 8,800 fewer cancer cases if the entire population gave up processed meats. In contrast, we would have 64,500 fewer cases of cancer if everyone gave up smoking. Cut down on hot dogs and bacon if you consume a lot of them. Otherwise, don't worry about it. (The New York Times, November 1, 2015)



BEEF AND DAIRY PROTEIN INCREASE POST-EXERCISE MUSCLE PROTEIN SYNTHESIS EQUALLY

THE LEGENDARY ANCIENT OLYMPIAN MILO OF CROTON WAS A SIX-TIME WRESTLING CHAMPION AT THE ANCIENT OLYMPIC GAMES IN GREECE. ACCORDING TO LEGEND, ONE SECRET TO HIS SUCCESS AND GREAT STRENGTH WAS THAT HE ATE 20 POUNDS OF BEEF EVERY DAY. Most modern bodybuilders consume beef, but get much of their protein intake from whey protein supplements. Nicholas Burd and colleagues from Maastricht University in the Netherlands found no difference between consuming 30 grams of beef or dairy protein on muscle protein synthesis or protein signaling following weight training. Protein synthesis was slightly faster in the dairy group during the first two hours of recovery, but was equal after five hours. (American Journal Clinical Nutrition, 102: 828-836, 2015)



Red Meat and Processed Meat Consumption Linked to Disturbed Blood Sugar Regulation

INCREASED LEVELS OF BLOOD SUGAR (GLUCOSE) AND INSULIN ARE SYMPTOMS OF PRE-DIABETES AND TYPE 2 DIABETES, WHICH ARE DISTURBANCES IN BLOOD SUGAR REGULATION. Diabetes increases the risk of heart attack, stroke, heart failure, kidney disease, blindness, impotence, amputation and premature death. A large meta-analysis, involving more than 60 research centers worldwide and 50,000 non-diabetic Caucasian patients, found a link between red and processed meat consumption and disturbances in blood glucose regulation. Consumption of processed meat was linked to increased blood glucose, while red meat consumption is linked to high blood levels of glucose and insulin. Genetic variations did not change the results. Consumption of red and processed meat is linked to higher body mass index (BMI; proportion of weight to height). Red and processed meat eaters tend to be fatter, which makes them more prone to type 2 diabetes. (American Journal Clinical Nutrition, 102: 1266-1278, 2015)

HIGH-SUGAR DRINKS LINKED TO OBESITY, DIABETES AND HEART DISEASE

LARGE POPULATION STUDIES FROM THE UNITED STATES AND EUROPE SHOW A CONSISTENT LINK BETWEEN CONSUMPTION OF HIGH-SUGAR BEVERAGES AND WEIGHT GAIN. These studies found that consuming only one eight-ounce high-sugar beverage causes weight gain in 12 months, compared to drinking diet beverages. The research reported that consistent consumption of high-sugar drinks increases the risk of dying from heart attack, stroke and congestive heart failure, regardless of weight. The drinks also raise blood sugar, which can eventually increase the risk of type 2 diabetes and increased blood fat. Increased blood sugar is converted to triglycerides (fat) in the liver, which wreaks havoc with metabolic health. Some experts think that the popularity of high-sugar drinks is responsible for the American obesity epidemic. (Nutrition Action Healthletter, November 2015)



High-Protein Diet Plus Weight Training *Improves Body Composition*

THE UNITED STATES DEPARTMENT OF AGRICULTURE RECOMMENDS THAT PEOPLE CONSUME 0.8 GRAMS OF PROTEIN PER KILOGRAM OF BODYWEIGHT. Active people might benefit from as much as 1.5 grams per kilogram. Jose Antonio from Nova Southeastern University in Florida, and colleagues, found that high protein intake (3.4 grams per kilogram of bodyweight per day) plus a periodized weight-training program showed greater decreases in bodyweight, percent fat and fat mass than a group consuming 2.3 grams of protein per kilogram of bodyweight. There were no differences in fat-free mass (largely composed of muscle). Previous studies showed overfeeding protein without weight training did not alter body composition. They concluded that intensely training athletes would benefit from protein intakes greater than 2 grams of protein per kilogram of bodyweight per day. (Journal International Society Sports Nutrition, 12: 39, 2015)

Calcium Supplements Increase Blood Pressure

MANY PEOPLE, PARTICULARLY WOMEN, TAKE CALCIUM SUPPLEMENTS TO MAINTAIN OR INCREASE BONE DENSITY. This could be a mistake. The United States Preventive Services Task Force, an independent think tank that reviews studies and develops clinical recommendations, advised women to avoid calcium supplements because they don't increase bone density and might increase the risk of heart attack. A study from the University of Auckland in New Zealand found that calcium supplements increased blood pressure and blood coagulation for up to eight hours. Calcium supplements might have severe and potentially deadly side effects. (British Journal Nutrition, 114: 1868-1874, 2015)

Paleo Diet Improves Metabolic Syndrome Symptoms

THE PALEOLITHIC OR CAVEMAN DIET IS BASED ON CONSUMING BERRIES, NUTS, LEAN GRASS-FED MEATS AND FISH. Proponents of the diet claim that human genes evolved over thousands of years to optimize metabolism from eating these natural foods. Industrialization changed the human diet suddenly to include the consumption of grains and calorie-dense, high fat, processed foods. Food choices also increased dramatically, which promoted overeating and overconsumption of unhealthy foods. Researchers from Bahrain and the Netherlands showed that the Paleolithic (caveman) diet improved symptoms of the metabolic syndrome, a cluster of risk factors that include abdominal fat deposition, abnormal blood fats, high blood pressure, insulin resistance and type 2 diabetes. Their study was a meta-analysis that combined the results of four well-controlled studies involving 159 people. People consuming the Paleolithic diet showed decreases in waist circumference, blood fats and blood sugar compared to people consuming a normal diet. Critics of the Paleolithic diet point out that the diets of ancient humans varied greatly from one place to another, so that it is unlikely that metabolically linked genes adapted uniformly. (American Journal Clinical Nutrition, 102: 922-932, 2015)

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Doping Rampant in Russian Sport

DR. MICHAEL KALINSKI IS CHAIRMAN OF THE DEPARTMENT OF APPLIED HEALTH SCIENCES AT MURRAY STATE UNIVERSITY IN KENTUCKY. Formerly, he chaired the biochemistry department at the University of Kiev and was an insider in the Soviet sport machine of the 1970s and '80s. For years, he has been writing about the sophisticated government-sponsored sports drug program in the old Soviet Union. Things haven't changed in Russia. A report from the World Anti-Doping Agency documented an incredible litany of abuses in the Russian sports program. Russian secret service agents intimidated lab personnel at sports drug-testing labs to cover up positive results, resulting in 1,400 destroyed samples.

Russian officials bribed anti-doping officials to dismiss positive tests. Russian sports officials routinely submitted phony samples from athletes who were taking banned substances. The report implicated Russian athletes, coaches, trainers, doctors and various government ministries in a large doping conspiracy. In response, the International Association of Athletics Federations—the international governing body for track and field—voted to provisionally suspend Russia from the organization, which could prevent their participation in the 2016 Olympics in Rio de Janeiro. The Russians are such major players in the Olympics that it is doubtful whether the suspension will stick. (The New York Times, November 9, 2015)

TESTOSTERONE GENERATES EXCESSIVE REACTIVE OXYGEN SPECIES

TESTOSTERONE REPLACEMENT THERAPY IS POPULAR THROUGHOUT THE WORLD.

Several studies found a link between low levels of testosterone, heart disease and premature death. The effects of testosterone supplements on heart health are less clear. Several recent studies found an increased risk of heart attack and stroke in men receiving testosterone, but these studies have been severely criticized by most hormone specialists. A review of literature by Brazilian scientists concluded that testosterone metabolism generates high amounts of reactive oxygen species (free radicals) that could eventually cause deterioration of the heart muscle. These are highly reactive compounds that can damage cell membranes, DNA and heart muscle. These findings are based on animal studies, which might not apply to humans. Most long-term testosterone studies in humans show that the supplements have many benefits that improve the quality of life and reduce the risk of premature death. (American Journal of Physiology: Regulatory, Integrative and Comparative Physiology. Published online November 4, 2015)

Growth Hormone Reduces the Risk of Fracture in Women With Osteoporosis

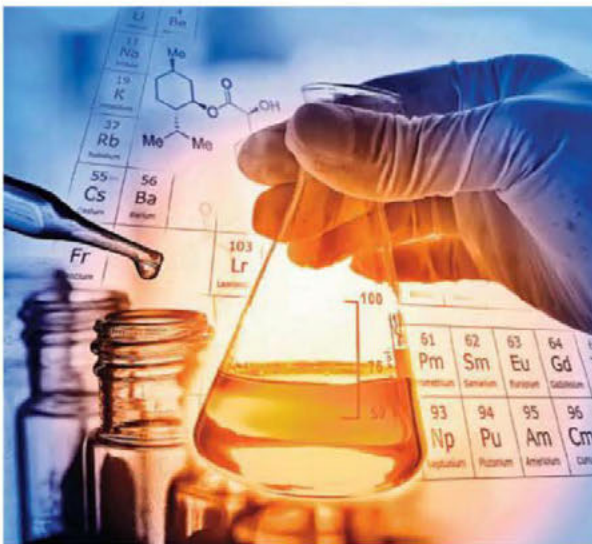
OSTEOPOROSIS IS A DECREASE IN BONE DENSITY THAT GREATLY INCREASES THE RISK OF FRACTURE. The disease is common in post-menopausal women but can occur in men, too. Bones can fracture with even minor stress, or break spontaneously. The most effective treatment for osteoporosis has been to prevent it during childhood. This doesn't help people with the disease. A 10-year study by Swedish researchers found that growth hormone (GH) therapy reduced fractures by 50 percent, compared to untreated women. Women who did not receive GH experienced more fractures. GH-treated women continued to have fewer fractures, even after treatment stopped. (Journal Clinical Endocrinology Metabolism, published online August 27, 2015)

GROWTH HORMONE REPLACEMENT DOES NOT CAUSE PREMATURE DEATH IN CHILDREN TREATED FOR GROWTH PROBLEMS

GROWTH HORMONE (GH) REPLACEMENT SUPPLEMENTS ARE POPULAR WITH AGING ADULTS.

Short-term studies show that GH supplements increase muscle and bone mass and decrease body fat in older adults. The long-term safety of GH treatment is controversial. Aarhus University researchers from Denmark, in a study on children treated for short stature, found that GH replacement did not increase the risk of premature death. Researchers studied 494 patients with growth hormone deficiency. Death rates for GH-treated patients were lower than for GH-deficient children who were not treated. The results of studies on GH-deficient children might not apply to older adults who take GH supplements or healthy, young bodybuilders. (Clinical Case Reports, published online August 3, 2015)





Scientists Developing Long-Acting Growth Hormone

GROWTH HORMONE-DEFICIENT CHILDREN AND ADULTS SOMETIMES TAKE DAILY SUBCUTANEOUS (UNDER THE SKIN) INJECTIONS. Treatment increases height (in children), improves body composition, increases bone density, attenuates cardiovascular disease risk factors and boosts physical fitness and the quality of life. Some GH manufacturers use pen devices that improve the convenience of daily injections. Unfortunately, compliance with daily injections is a problem because they are inconvenient, somewhat painful and distressing. Noncompliance decreases the effectiveness of the drugs and increases health care costs. Scientists are working on long-acting growth hormone preparations that will increase compliance and help patients cope with their reluctance to adhere to daily injection schedules. (Growth Hormone & IGF Research, 25: 201-206, 2015)

THIAZIDE DIURETICS INCREASE BLOOD SUGAR

MANY BODYBUILDERS HAVE HIGH BLOOD PRESSURE, AND SOME ARE TREATED WITH THIAZIDE DIURETICS SUCH AS CHLORTHALIDONE OR HYDROCHLOROTHIAZIDE. Both drugs reduce systolic blood pressure (top blood pressure number) by 12 millimeters of mercury. High blood pressure increases the risk of heart attack, stroke, impotence and premature death, so treatment is imperative. Thiazide diuretics increase blood sugar, which could promote abdominal fat deposition, abnormal blood fats and type 2 diabetes. Chinese researchers found that reducing the dose of the thiazide diuretic reduced blood sugar levels and still lowered blood pressure. (Journal of Hypertension, published online September 23, 2015)

Testosterone Supplements Improve Body Composition and Blood Sugar Control

PRESCRIPTIONS FOR TESTOSTERONE FOR MIDDLE-AGED AND OLDER MEN HAVE TRIPLED IN THE LAST DECADE. Clinics treating "low T" have sprung up in cities and hamlets across America. Testosterone supplements have been controversial since the hormone was synthesized in 1934. Experts still argue about its risks and benefits. Italian researchers combined the results of 59 studies on testosterone supplements using a technique called meta-analysis. The studies involved more than 3,000 patients (average age 62) who used a variety of drugs and doses. Testosterone supplementation caused decreases in bodyweight, waist circumference, total fat, blood sugar and insulin resistance, and increased lean mass. Testosterone had no effect on blood fats (cholesterol, triglycerides, HDL) or blood pressure. The positive effects were greater in younger men. Testosterone supplements have positive effects in middle-aged and older men. (European Journal of Endocrinology, published online November 4, 2015)



NANDROLONE Toxic to Rabbit Hearts

SOME RESEARCH SHOWS THAT LONG-TERM USE OF ANABOLIC STEROIDS IS HARMFUL TO THE HEART. Greek researchers found that rabbits given nandrolone decanoate (Deca) for six months developed heart problems. The animals were given either a high dose or low dose of Deca, or a placebo (fake Deca). Heart tissue in the high-dose group showed fibrous tissue development and inflammation, and impaired heart contractions. The heart tissue showed evidence of oxidative damage. Deca also caused thickening of the heart muscle. It is not known whether these results apply to humans. (Toxicology Letters, published online November 2, 2015)

Creatine Might Prevent Post-Exercise Muscle Soreness

INTENSE WEIGHT TRAINING, PARTICULARLY INVOLVING ECCENTRIC MUSCLE CONTRACTIONS (LENGTHENING CONTRACTIONS), CAN TRIGGER DELAYED-ONSET MUSCLE SORENESS (DOMS). Intense training causes small injuries to the muscle fibers. This causes an inflammatory response that helps heal the tissue. Creatine monohydrate supplements might speed recovery from intense weight training and reduce the severity of DOMS— according to a literature review led by Jooyoung Kim from Kookmin University in Korea. Creatine might reduce oxidative stress, modify inflammation, enhance muscle cell calcium metabolism and promote satellite cell activation— all of which might promote healing and speed recovery. We need more research before we know for sure. (Journal of Exercise Rehabilitation, 11: 244-250, 2015)



Bitter Orange Extract Plus Caffeine IMPROVES SQUAT ENDURANCE

BITTER ORANGE (CITRUS AURANTIUM) IS A NERVOUS SYSTEM STIMULATOR INCLUDED IN MANY WEIGHT-LOSS AND ENERGY-BOOSTING SUPPLEMENTS. A chemical called p-synephrine is responsible for its effects. A study led by Nicholas Ratamess from the College of New Jersey found that supplementing p-synephrine or caffeine plus p-synephrine improved squat endurance in college-age males. Subjects performed squats for six sets of 10 repetitions at 80 percent of maximum. Adding caffeine to p-synephrine had a small effect on endurance during the later sets. The energy-boosting effects of these supplements reduce the perception of fatigue during exercise and make workouts seem easier. They might improve performance by increasing training adherence (i.e., showing up at the gym). Other studies have concluded that bitter orange extract is safe when taken as directed. (Journal International Society Sports Nutrition, 12: 35, 2015)

Vitamin D Increases Upper and Lower Body Muscle Strength

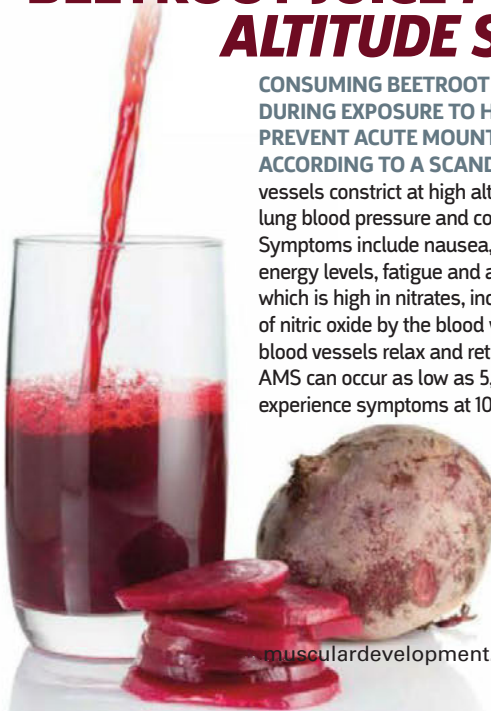
LOW VITAMIN D LEVELS ARE LINKED TO POOR BONE HEALTH, MUSCLE WEAKNESS, DEFICIENCIES IN REPRODUCTIVE HORMONES, LOW AEROBIC CAPACITY AND INCREASED BODY MASS INDEX (THE PROPORTION OF WEIGHT TO HEIGHT). A meta-analysis by British researchers that combined the results of seven studies concluded that vitamin D supplements (4,000 per day and 14,000 to 60,000 international units per week) increased muscle strength in active, healthy, young adults. Vitamin D is synthesized in the body in a reaction involving sunlight. It can also be consumed in the diet by eating fatty fish, mushrooms and supplements. The supplement works best in people who were vitamin D-deficient (less than 30 nmol per liter) and in people over 65. Vitamin D is important for muscle growth, but it won't make much difference in most young, well-nourished bodybuilders. (Journal of Science and Medicine, 18: 575-580, 2015)



BEETROOT JUICE PREVENTS ALTITUDE SICKNESS

CONSUMING BEETROOT JUICE BEFORE AND DURING EXPOSURE TO HIGH ALTITUDE MIGHT PREVENT ACUTE MOUNTAIN SICKNESS (AMS)—ACCORDING TO A SCANDINAVIAN STUDY. Blood vessels constrict at high altitude, which increases lung blood pressure and contributes to AMS. Symptoms include nausea, vomiting, decreased energy levels, fatigue and anxiety. Beetroot juice, which is high in nitrates, increases the production of nitric oxide by the blood vessels, which helps the blood vessels relax and return to normal function. AMS can occur as low as 5,000 feet. Most people experience symptoms at 10,000-12,000 feet. Drugs

such as acetazolamide and dexamethasone are currently used to treat and prevent AMS. Beetroot is a healthier alternative. (Nitric Oxide, 50: 58-64, 2015)



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SUPPLEMENT CUTTING-EDGE RESEARCH

HMB PLUS WHEY PROTEIN SPEEDS RECOVERY FROM INTENSE EXERCISE

A SUPPLEMENT CONTAINING WHEY PROTEIN, HMB (BETA-HYDROXY-BETA-METHYLBUTYRATE) AND A SLOW-RELEASING CARBOHYDRATE (EAS RECOVERY PROTEIN, RP) PROMOTED RECOVERY FROM INTENSE WEIGHT TRAINING MORE THAN WHEY PROTEIN ALONE— ACCORDING TO A STUDY FROM OHIO STATE UNIVERSITY. Athletes performed intense weight training for three days— one heavy resistance workout (six exercises, total of 20 sets, three to five reps per set, three minutes of rest between sets) and two metabolic workouts (six exercises, total of 18 sets, eight to 10 reps per set, 30 seconds of rest between sets). Compared to whey, subjects consuming RP showed lower levels of muscle damage markers (creatinine kinase, interleukin-6), less muscle soreness and greater vertical jump performance in the days following the workouts. Sophisticated radioactive tracer studies by other researchers found that HMB prevented muscle protein breakdown, stimulated muscle growth and promoted fat breakdown. HMB plus whey is a good supplement for bodybuilders. (Journal of the American College of Nutrition, 34: 91-99, 2015)



NAC MIGHT IMPAIR MITOCHONDRIA PRODUCTION FROM ENDURANCE TRAINING

NAC (N-ACETYLCYSTEINE) MIGHT INTERFERE WITH THE PRODUCTION OF CELL MITOCHONDRIA NORMALLY TRIGGERED BY ENDURANCE TRAINING— ACCORDING TO CHINESE RESEARCHERS. Mitochondria are the powerhouses of the cell that are important for cell health and aerobic capacity. NAC is an amino acid byproduct found naturally in foods that fight free radicals. Free radicals are highly reactive chemicals produced naturally during metabolism that can break down cell membranes, destroy DNA, trigger muscle soreness and protein breakdown, impair the capacity of the immune system and lead to cardiovascular disease. The Chinese study on mice found that NAC plus aerobic exercise reduced production of a chemical marker of mitochondrial production (cytochrome C oxidase). NAC helps buffer the effect of excessive free radical accumulation, but it could interfere with the production of cell mitochondria. (Free Radical Biology and Medicine, 87: 326-335, 2015)

Protein Supplements Do Not Alter Hormone Signaling After Training

CHEMICALS CALLED RIBOSOMAL PROTEIN S6 KINASE (S6K1) AND THE TARGET OF RAPAMYCIN (MTOR) ARE IMPORTANT CELL-SIGNALING MOLECULES THAT ARE SENSITIVE TO SMALL CHANGES IN AMINO ACID STATUS, AND ARE MAJOR FORCES IN MUSCLE PROTEIN SYNTHESIS AND HYPERTROPHY. They work like biological computer programs to line up amino acids needed to produce new muscle tissue. After weight training, feeding essential amino acids

activates protein-signaling molecules that promote protein synthesis and muscle growth. Jay Hoffman from the University of Central Florida found that intense weight training caused increases in insulin, growth hormone and cortisol, but protein supplements did not cause additional stimulation. The study showed a possible dissociation between hormone anabolic signaling and activation of the primary anabolic pathway. (Nutrition Research, 35: 990-1000, 2015)

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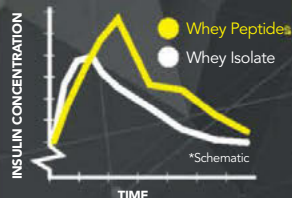
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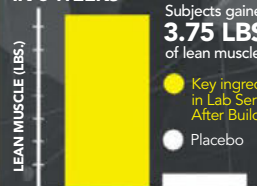


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Outed by Ashley Madison Hack?

WHAT DO YOU DO IF YOUR NAME WAS AMONG THE 30 MILLION LEAKED IN THE RECENT HACK OF THE ASHLEY MADISON EXTRAMARITAL AFFAIR SITE? Elizabeth Bernstein, the Dear Abby of The Wall Street Journal says, "Confess before you get caught." Chances are, she is going to find out anyway. A 2007 MSNBC poll of 30,000 people who cheated on their spouse found that most got caught or their spouse suspected they were having an affair. Many therapists advise the opposite: if you're getting away with it and the spouse doesn't suspect, confessing isn't going to help the marriage. There are four ways that people get caught: the guilty party confesses without prior interrogation from the spouse; the guilty party admits it after being questioned by a suspicious spouse; the spouse catches the cheater red-handed; or a third party rats you out. The least damaging is when the cheating spouse admits cheating without being asked. We recommend that you say the following: "I didn't do it. If I did it, I can explain it. If I can't explain it, I promise never to do it again." (The Wall Street Journal, November 16, 2015)

CIALIS DECREASES ANTIOXIDANT CAPACITY

CIALIS (TADALAFIL) IS A POPULAR ERECTION-PROMOTING DRUG THAT MANY MEN TAKE DAILY TO IMPROVE SEXUAL PERFORMANCE AND TREAT PROSTATE ENLARGEMENT. The drug has been around since 2001, and rakes in more than \$5 billion a year in sales. The drug appears safe, with less than three percent of users experiencing headache, upset stomach, back pain, diarrhea, muscle pain and dizziness. However, there might be long-term side effects. Italian researchers found that Cialis decreased antioxidant capacity and made people more susceptible to oxidative stress during exercise. Reactive oxy-

gen species (free radicals) are generated during normal metabolism. These chemicals are highly reactive and can damage cell membranes and DNA, impair the immune system and contribute to muscle soreness. Antioxidants neutralize reactive oxygen species and prevent cell damage. Chronic use of Cialis could make the body more susceptible to oxidative damage. Possible problems might include heart disease, type 2 diabetes and cancer. At this time, there is no convincing evidence of a cause-and-effect relationship between Cialis, heart disease, and cancer. (European Journal of Applied Physiology, 115: 531-539, 2015)



SLEEP APNEA LINKED TO SEXUAL PROBLEMS IN MEN AND WOMEN

MANY BODYBUILDERS SNORE OR WAKE UP FREQUENTLY WHILE THEY SLEEP BECAUSE THEIR LARGE NECK MUSCLES OBSTRUCT AIRFLOW IN THE MOUTH AND THROAT. If you have these symptoms, you might have sleep apnea that could make you fat or even kill you. Chinese researchers found that sleep apnea was linked to sexual problems in men and women. They pooled the results of nine studies involving 1,275 patients, which showed that obstructive sleep apnea was linked to erectile dysfunction in men and female sexual dysfunction in women. Sleep apnea contributes to obesity and daytime sleepiness that can result in poor metabolic and blood vessel health, which are critical for good sex. Sleep apnea is treatable through weight loss, surgery or continuous positive airway pressure devices (CPAP). (Journal of Sexual Medicine, 12: 1992-2003, 2015)



THE CHANGING PORN BUSINESS

PORN IS MORE POPULAR THAN EVER, ONLY NOW IT IS FREE. IN THE LATE 1970S, PEOPLE PAID A PREMIUM FOR PORNO VIDEO-TAPES AND PORN STARS MADE A FORTUNE. By the early 2000s, there were more than 3,000 porn sites and film producers were cranking out about 150 videos per week. Porn sites starting including free teasers to attract customers. Gradually, people expected porn for free. That was the beginning of the end for mom-and-pop porno filmmakers. Porn studios declined from a high of 200 to about 20. Porn stars took a cut in pay from \$1,500 an hour to \$500, and were asked to produce more extreme content. The porn business model changed gradually. Porn sites have 100 million visitors per day. They still make money because some of the millions of porn fans sign up for pay sites. A few large companies dominate the business, and porn sites make most of their money from ads. (The Economist, September 26, 2015)



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YOU MAKE \$200,000 A YEAR, BENCH PRESS 400 POUNDS AND SPEAK FOUR LANGUAGES. Think you have the world by the tail? Not if you are a slob, lazy, needy or have no sense of humor. Women are more concerned with "deal breakers" than positive attributes. Every woman has different deal breakers. For some, drug use, an unclear career path or atheism is at the top of the list. For others, deal breakers might include being too athletic, a rigid belief system or crooked teeth. Move on if her deal breakers are ridiculous and irrational. If you make \$200,000 a year, you will find plenty of women who will cut you some slack. (The Wall Street Journal, November 2, 2015)

Clomid Helps Treat Premature Ejaculation

MANY BODYBUILDERS USE CLOMID (CLOMIPHENE) TO JUMP-START THEIR SYSTEM AFTER COMING OFF AN ANABOLIC CYCLE. After six weeks on anabolic steroids, testosterone is typically at ground zero. Clomid stimulates the hypothalamus to release hormones that stimulate natural testosterone production. Clomid is mainly used by OB-GYNs to stimulate ovulation and pregnancy. Iranian scientists found that it was an effective treatment for premature ejaculation. Men with premature ejaculation were treated with the drug or placebo (fake Clomid) for six months. Seventy-seven percent of Clomid-treated men experienced an improvement. Premature ejaculation is the most prevalent sexual problem in men. Clomid might be the answer. (Nephro-Urology Monthly, 7(5): e27281, 2015)

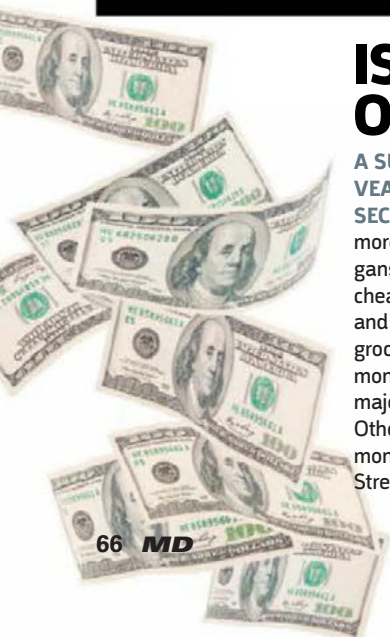
EXPERTS HAVE TROUBLE MEASURING PENIS SIZE

ALMOST ALL MEN LIE ABOUT THEIR BENCH PRESS AND PENIS LENGTH.

Anyone with experience knows that you can tell a guy's true bench press by the size of his chest and guns, and his gym experience. Penis length isn't so easy, because even the experts have problems. A study from researchers in Saudi Arabia assessed penis length by measuring a stretched, flaccid penis. The results were compared to measurements following injection, which produced a full erection. Expert estimation of penis length from a flaccid penis underestimated length by 21 percent and girth by 20 percent. Measuring the erect penis is the best way to get an accurate measurement. (Journal Sexual Medicine, 12: 2031-2035, 2015)

IS YOUR SIGNIFICANT OTHER SNEAKING MONEY?

A SURVEY OF 23,000 ADULTS BY TODAY.COM AND SELF.COM REVEALED THAT 46 PERCENT OF MARRIED PEOPLE KEEP FINANCIAL SECRETS FROM THEIR SPOUSES. Many American households spend more money than they earn, which sets the stage for financial shenanigans. Paying in cash to avoid a paper trail is a favorite method of financial cheaters. They typically make frequent, small withdrawals from the ATM and then salt the money away in a secret account. Some women will pad grocery store purchases with gift cards that they can later use for fun money. Others have secret credit cards or bank accounts. This can cause major problems when the couple applies for a mortgage or auto loan. Others just lie about purchases or their real prices. Resolving deceptive money practices can ruin a family's budget and lead to divorce. (The Wall Street Journal, November 2, 2015)





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RESEARCH UPDATE

BILE ACIDS FOR FAT LOSS

There are few things available in the pharmacopeia of prescription drugs that are effective in promoting fat loss. The most effective drugs have been pulled from the market, or the U.S. Food and Drug Administration (FDA) has determined that the public welfare is better served if improving body composition is not an indication for use. Clinical trials are considered successful if subjects lose five percent of bodyweight—note: weight, not specifically fat mass. Note further, this relatively modest loss can occur over six weeks or 12 months—it matters little to the clinical researchers.

Ironically, obesity became more prevalent during a time when the “experts”—meaning cardiologists and dietitians—promoted the low-fat diet as the pinnacle of nutritional health. Unbeknownst to all was the function of a class of molecules secreted in bile during a fat-containing meal, something that appears to promote the thermogenic effect of a meal and have other positive metabolic effects. This class of molecules is called bile acids, including cholic acid, chenodeoxycholic acid, ursodeoxycholic acid and several bioactive metabolites.

In 1999, researchers became aware that bile acids interacted with a nuclear receptor (FXR) that positively affected a number of processes, with the potential to correct insulin resistance, obesity,

kidney and liver disease, and so much more.¹ Then, in 2003, a study was published that revealed the presence of yet another receptor

that is activated by bile acids—TGR5.² Unlike FXR, TGR5 does not interact with the nucleus or DNA. It produces non-genomic effects, meaning fairly rapid and short acting. The effects created are best understood in brown fat, a thermogenic tissue that is an area of extensive research in the field of obesity prevention and treatment.³ Additional receptors that interact with bile acids have been described, but are not as well understood at this time.⁴

METABOLIC EFFECT OF BILE ACIDS

With time, the metabolic effect of bile acids was better elucidated, revealing a number of mechanisms that not only maintain health, but also work to improve body composition—in other words, reduce body fat. The processes affected by the FXR interaction promote metabolic health by reducing fatty acid and triglyceride production, as well as VLDL lipoprotein synthesis, in the liver. These are factors that affect your “cholesterol profile” and when elevated, are associated with an increased risk of cardiovascular disease. Also, gluconeogenesis in the liver is suppressed, which reduces the conversion of fatty acid and amino acid metabolites into



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glucose (sugar) to be released into the bloodstream. Inappropriate or poorly regulated gluconeogenesis is part of the progression into insulin resistance and later, type 2 diabetes. Interestingly, the benefits of metformin, the first-line drug in type 2 diabetes treatment and prevention, may be mediated in part by increasing circulating bile acids.⁴

Another metabolically potent system is induced by bile acids via the FXR pathway in ileal enterocytes, cells near the end of the small intestine.⁵ When bile acids activate FXR in these cells, a hormone called FGF15 is produced that propagates many of the metabolic benefits seen from bile acid studies.⁶ It demonstrates the bioeffective role of oral administration of bile acids. Note, as FGF15 decreases bile acid production by suppressing the rate-limiting enzyme, supplementation may provide a greater than physiologic effect.⁷ Further, some of the

benefits of gastric bypass, a surgical technique with some risk that has shown such pronounced and dramatic weight-loss benefits that it has even been suggested to be a “cure” for type 2 diabetes, have been replicated by diverting the bile duct so it empties at the far end of the small intestine (the ileum) rather than the near end (the duodenum). This would increase the concentration of bile acids contacting the ileal enterocytes as well as returning to the liver via the portal circulation.⁸ This is a very powerful finding.

Bile acids also bind to TGR5 receptors in another type of intestinal cell that stimulates the release of GLP-1, an incretin hormone that stimulates insulin release in the presence of a meal.⁹ GLP-1 also slows gastric emptying and motility, providing an earlier sense of “fullness.” Interestingly, GLP-1 function is disrupted in shift workers exposed to

THE PROS AND CONS OF CLA

By Daniel Gwartney, M.D.

For the healthy, normal-weight, active adult, CLA may add a bit to fat-loss efforts.

There are certain products that have a measurable effect—a marginal effect, many times—but still show promise in promoting fat loss. Most of them were introduced years before any relevant information was really available, before the market or the marketers understood the degree of effect, conditions necessary and appropriate subjects who might benefit. Of course, this didn't prevent some from pushing product to market, often with claims based upon test tube data, animal trials or pipe dreams.

In many ways, conjugated linoleic acid (CLA) has failed as a weight-loss ingredient, in part because it was not “ephedrine-strong,” an expectation held when it first came to market. Further, the actual effects, even the specific molecule that is “CLA,” were unclear. Well, about 20 years after it came to market, enough is now known to discuss the value of CLA. Accordingly, a fairly comprehensive review on the CLA's role in altering body composition was recently published in the *Journal of the International Society of Sports Nutrition*.¹

CLA, as used in supplements, exists as one of two isomers (chemical cousins), and most products contain a blend of both. Though the isomers are very similar, the effects in the body are not identical, and variations in the blends make it difficult to compare study results reliably. Early rat studies showed measurable and rapid changes in body composition, with fat loss occurring within seven days. However, the human trials are less

convincing. Again, different doses, exercise (or not), duration and material make it difficult to come to a definitive conclusion. In essence, it appears that CLA may be most beneficial to overweight or obese women who are exercising. Normal-weight individuals do not appear to receive a measurable benefit, though some studies do show improvements in cholesterol measures.

It is a bit of a disappointment, as the mechanisms for CLA appear to be very supportive toward a weight-loss effect. However, for a supplement to have an effect, it has to bolster or replace a metabolic deficiency, and this may only be the case in an overweight or obese person. CLA has been shown to have effects that would support fatty acid oxidation and reduce fat mass if there is a deficiency in action or the proper conditions to create this effect. CLA induces an increase in a carnitine-based transport protein that transfers fatty acids from the cell's interior into the mitochondria where the actual “burning” of calories occurs. As was noted with L-carnitine supplementation, activity of this enzyme is often not a factor in the rate of fat burning in normal-weight, sedentary people on a normal diet. However, for those with higher activity levels, on a high-fat diet, hypocaloric diet or using thermogenic drugs, there may be a benefit in increasing the activity of this transporter.

Inside the mitochondria, the rate of fat burning is closely tied to energy demands. However, fat calories can

be “wasted” if the activity of another class of protein is increased, called uncoupling proteins. Again, CLA appears to increase the activity of uncoupling proteins in fat-storage tissue (i.e., white adipose tissue). However, this has only been shown conclusively in rats, which are rapid responders to CLA in regard to fat loss. An increase in uncoupling leads to an increase in body temperature if it is significant, and this is not a reported experience with CLA supplementation. Hence, its effect in humans may be present, but relatively minor, if so.

A final mechanism involves the interaction with a class of receptors that regulate metabolism and energy balance called PPAR. This includes three main forms: alpha beta and gamma. CLA aids in promoting the effects of PPAR-alpha and -beta, which are involved in increasing the metabolic rate, fatty acid oxidation (i.e., fat burning) and satiety (feeling “full” with a meal). Conversely, CLA inhibits some of the effects of PPAR-gamma, including lipogenesis (storing new fat), responding to insulin to “grab” nutrients from the bloodstream, forming new fat cells (i.e., differentiation) and reducing the membrane-bound enzyme that splits fatty acids off circulating (i.e., in the blood) triglycerides to be taken in to store as fat.

The effects of CLA all are potential aids in reducing fat mass. However, the PPAR-gamma-inhibiting effects hold a few disadvantages, especially in those who might depend solely on CLA for fat loss. Reducing

PPAR-gamma is associated with increasing insulin resistance, and an increase in total triglycerides and cholesterol in the blood. These effects are components of the metabolic syndrome, which is associated with numerous adverse health conditions, such as cardiovascular disease and type 2 diabetes. Again, the effect of CLA is limited for both the good and bad, so a person who is active and following a reasonable diet, with no history of insulin resistance or cholesterol issues, would have relatively little to worry about. The couch potato with no control over eating habits, already suffering from pre-diabetes or at risk of cardiovascular disease, may actually be adding to the metabolic challenge by trying to force weight loss by using CLA.

For the healthy, normal-weight, active adult, CLA may add a bit to fat-loss efforts. Women may experience a greater benefit, as the effect on fat cell progenitor differentiation may be more resilient for them. Men have naturally higher testosterone and DHT, which provide the same effect. As with most supplements, some swear by CLA, and others have been left disappointed. The early science remains supportive—it just remains to be seen which people and conditions CLA works best, or at all, for.

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1. Lehnen TE, da Silva MR, et al. A review on effects of conjugated linoleic fatty acid (CLA) upon body composition and energetic metabolism. *J Int Soc Sports Nutr* 2015;Sep 17;12:36. doi: 10.1186/s12970-015-0097-4.

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FAT attack

bright lights during nighttime hours (this is likely also the case with late-night gamers, etc.).¹⁰ This results in markedly higher GLP-1 and insulin levels following a meal. As bile acids aid in maintaining, and possibly restoring insulin sensitivity via a separate pathway (FXR), they may be helpful in suppressing the harmful metabolic effects of shift work.

The TGR5 receptor is bound in the membrane of numerous tissues, including brown fat and skeletal muscle. When activated by bile acids, enzymes inside these cells are activated, resulting in an increase in cAMP—a secondary messenger that is central to many fat-burning pathways. In brown fat, as well as skeletal muscle, this leads to an increase in an enzyme called type 2 iodothyronine deiodinase (D2)—the enzyme that converts the less active thyroid hormone T4 into the metabolic accelerant form, T3.³ The resulting effect is an increase in energy expenditure (i.e., calorie burning) as well as fatty acid oxidation (fat burning) and uncoupling (calorie wasting).

CAN BILE ACIDS PROMOTE FAT LOSS?

A plethora of test-tube science and animal studies is always comforting, but the “proof is in the pudding,” as the old saying goes. Do bile acids have anything to do with metabolic rate in actual humans, and can they promote fat loss? In fact, such evidence does exist. In 2012, a study looking at normal adult subjects, and those with cirrhosis (severe liver damage), showed that the level of bile acids in the blood was directly correlated to the metabolic rate.¹¹ Even though the number of subjects was small, it was a strong enough association to reach statistical significance, which is remarkable when studies use small groups. It was also shown that the postprandial (after a meal) increase in bile acids is associated with a decrease in TSH, the pituitary-stimulating hormone to the thyroid. This was suggestive that the increase in metabolic rate was due to a rapid and direct effect on thyroid hormone activity, possibly by increasing the conversion

of T4 to T3.

Now, research has been published just this year showing that administration of chenodeoxycholic acid as a drug treatment is effective in increasing energy expenditure in adult human subjects.¹² Further, when researchers administered chenodeoxycholic acid, other bile acids as well as TGR5-agonist drugs in development to brown fat taken from adult humans, they demonstrated an uncoupling effect at the mitochondria (wasting fat calories) and an increase in the D2 enzyme. This is near to being the holy grail of fat loss—effortless fat loss by activating brown fat and skeletal muscle to just waste extra calories on demand. Unfortunately, the effect is somewhat limited, increasing the metabolic rate in brown fat by only 40 percent. The uncoupling and increase in energy expenditure that occurs under the influence of exposure to cold is nearly 10 times stronger. Note, other stronger bile acids and TGR5 agonists were noted, so it is possible that this effect could be augmented through combination therapy or the use of pharmaceutical analogs. As the dose of chenodeoxycholic acid was 15 milligrams per kilogram with a meal, it would be possible to achieve this level of intake of blended bile acids via over-the-counter ox bile extract. It is also likely that a person with greater skeletal muscle mass may experience a greater effect, as both skeletal muscle and brown fat are similarly affected by bile acids.

As with all drugs and supplements, there may be unforeseen, adverse effects (i.e., negative side effects). Many people experience gastric complaints when taking bile acids, and there is very likely a role played by the gut microbiota.¹³ Is it possible a person with a “lean” gut microbiota might experience a greater increase in energy expenditure with bile acids, as compared to someone with “obese” gut microbiota? Also, bile acids may affect other tissues, such as the sperm-producing cells in the testes.¹⁴ Clearly, this is an exciting area of research. Hopefully, answers such as this will be answered so that the true benefit can be understood and realized. ■

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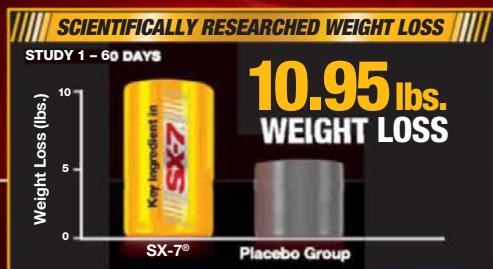
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CREATINE MONOHYDRATE: THE BEST STRENGTH ENHANCER

Creatine monohydrate is one of the most potent strength- and power-enhancing supplements on the market, with numerous studies demonstrating the positive influence of creatine monohydrate supplementation on strength and power, especially during high-intensity exercise performance.¹ The unique capacity of creatine to boost strength stems, in large part, from creatine's ability to function as a primary energy storage molecule that rapidly reverses the depletion of muscle cell energy (ATP) that occurs during muscular contraction. The maintenance of energy levels in the muscle cell boosts muscular contraction force, generating superior strength.² In addition, creatine also improves muscle growth by triggering many different cellular mechanisms, including the stimulation of muscle cell formation³ and increased muscle protein synthesis⁴, which further contributes to the remarkable potency of creatine to improve strength, as larger muscles loaded with energy are even more effective at generating muscular strength and power.

PUMP UP STRENGTH AND POWER WITH BETAINES

Betaine, also known as trimethylglycine, is a nutrient that functions as an osmolyte within cells, protecting the cell against dehydration by increasing cellular water retention via osmosis. The ability of betaine to maintain hydration reduces the negative impact that dehydration has on exercise performance, such as increased heart rate, increased rate of glycogen degradation, elevated muscle temperature and increased lactate levels.

In addition to betaine's ability to counter dehydration, this nutrient also plays a key role in the biosynthesis of the strength-enhancing compound creatine, essentially making it a very potent strength-building nutrient itself. In fact, betaine (2.5 grams of BetaPower™ Natural Betaine) use has been shown to significantly increase anaerobic power and strength in the bench press and squat.⁵

POWER YOUR MUSCLES WITH ATP

Adenosine triphosphate (ATP) is another nutrient with an extraordinary capacity to boost strength and power. Oddly enough, the ability of ATP to

boost strength and power has very little, if anything, to do with its primary function as the principal energy supplier for all energy-dependent functions within the body. In fact, studies have shown that oral administration of ATP degrades the high-energy phosphate bonds within ATP, and therefore ATP's capacity to supply energy, yet oral intake of ATP still effectively increases strength.⁶ That is because the ability of ATP to enhance strength and power comes from a collection of extracellular ATP functions that have nothing to do with the capacity of ATP to supply cellular energy from its high-energy phosphate bonds. These effects are triggered when ATP binds to a specific set of adenosine receptors embedded within the cell membrane, initiating certain cellular-signaling cascades that ultimately produce considerable gains in strength and power.

ENHANCED CONTRACTILITY

Calcium facilitates the interaction between the two muscle proteins actin and myosin, which directly drives muscular contraction. Therefore, more calcium within the muscle cell increases actin-myosin interaction, which generates stronger muscular contractions, increasing strength. Recent scientific evidence has shown that muscular contraction triggers the release of ATP from the muscle cell. After release from the muscle cell, ATP binds to the adenosine receptor on the outside of the muscle cell, triggering an increase in calcium within the muscle.^{6,7,8} In addition, it has also been shown that directly adding ATP to isolated muscle tissue also boosts intramuscular calcium levels, suggesting that external sources of ATP, or ATP supplementation, can also enhance muscular contraction.⁸

Since ATP increases muscle-cell calcium levels for improved muscular contractile forces, researchers wanted to see if supplementation with ATP could actually enhance muscular performance. One study by Jordan et al.⁹ showed that 225 milligrams of ATP per day for two weeks, combined with resistance training, resulted in an increase in total load lifted in the bench press, along with a significant increase in the number of repetitions performed during the first set. Another study by Wilson et al.¹⁰ showed that 12 weeks of ATP supplementation at 400 milligrams per day, combined with weight training, increased total body strength as well as muscle size. Altogether, these results indicate that oral ATP supplementation increases muscular contraction forces, enabling a higher strength output.

INCREASED MUSCULAR POWER AND STRENGTH CAN BE BOLSTERED BY CERTAIN NUTRIENTS THAT AUGMENT THE FORCE-PRODUCING CAPACITY OF THE CONTRACTILE MACHINERY WITHIN THE MUSCLE CELL, RESULTING IN SUPERIOR POWER AND STRENGTH.

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ENERGIZE FOR STRENGTH AND POWER

In addition to increased calcium within muscle cells enhancing muscular contractility, additional studies have shown that ATP-induced calcium increase within muscle tissue also increases the influx of glucose into the cell¹, supplying the muscle cell with greater levels of energy. It has also been shown that increased calcium levels within the liver from ATP consumption increase the conversion of glycogen into glucose^{11,12}, so it can be used as an energy source by muscle tissue as well as the rest of the body. Since glycogen is abundantly stored in the liver, the conversion of glycogen into glucose triggered by ATP provides a large source of energy for the muscle cell, improving muscular strength and power.

RAPID ENERGY FOR RAPID STRENGTH AND POWER

Unlike the previously mentioned compounds, caffeine uniquely increases strength and power by enhancing both contraction force and cellular energy within muscle. Caffeine is able to achieve this dual impact because of the similar chemical structure of caffeine to the molecule cyclic AMP (cAMP) and adenosine. The chemical similarity to cAMP gives caffeine the ability to block certain enzymes that degrade cAMP, effectively increasing cAMP levels within the muscle cell. The greater amount of cAMP functions as a signal activating several enzymes within the muscle cell that break down glycogen and fatty acids into energy, resulting in more energy that boosts strength and power. The structural similarity of caffeine to adenosine enhances muscular contraction force, as caffeine can bind to adenosine receptors embedded within the muscle cell—triggering an increase in calcium release within the muscle cell which, as previously mentioned, raises the number of actin-myosin interactions generating stronger, more powerful, muscular contractions.¹³

MUSCLE BUFFERING FOR STRENGTH AND POWER

Citrulline boosts strength and power in a unique way relative to all of the previously mentioned compounds, in that it rids the cell of certain metabolic byproducts that inhibit muscular contraction—which in due course, results in improved strength and power. Exercise-induced muscle fatigue is due to many different factors, including the accumulation of certain metabolites within the muscle cell such as ammonia.^{14,15} During intense exercise, the conversion of adenosine triphosphate (ATP) into adenosine monophosphate (AMP) provides the necessary energy for muscular contraction, while also increasing AMP levels. The greater amount of AMP from muscular contraction results in higher ammonia levels because the body breaks down AMP into ammonia. The accumulation of ammonia inhibits the metabolism of pyruvate in the muscle cell¹⁶,

reducing energy production while also increasing lactic acid production, which consequently has a negative influence on muscular contraction and exercise performance. Citrulline malate reduces the accumulation of ammonia by triggering the urea cycle, the biochemical pathway that reduces ammonia levels by converting it into urea. This, of course, reduces lactic acid accumulation as well. Moreover, the ability of citrulline to reduce lactic acid levels during high-intensity exercise considerably improves strength and power.¹⁷ ■

For most of Michael Rudolph's career he has been engrossed in the exercise world as either an athlete (he played college football at Hofstra University), personal trainer or as a research scientist (he earned a B.Sc. in Exercise Science at Hofstra University and a Ph.D. in Biochemistry and Molecular Biology from Stony Brook University). After earning his Ph.D., Michael investigated the molecular biology of exercise as a fellow at Harvard Medical School and Columbia University for over eight years. That research contributed seminally to understanding the function of the incredibly important cellular energy sensor AMPK—leading to numerous publications in peer-reviewed journals including the journal *Nature*. Michael is currently a scientist working at the New York Structural Biology Center doing contract work for the Department of Defense on a project involving national security.

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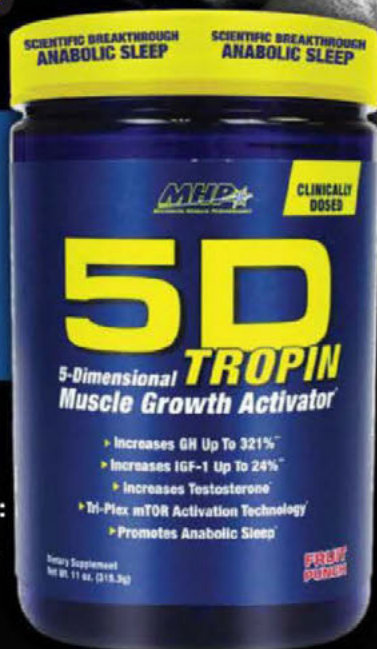
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BETAPOWER™ NATURAL BETAINE:

FOR BOOSTING STRENGTH, POWER AND PERFORMANCE



Mom and Popeye were right when they told us to eat our spinach! These nutrient-rich green leaves contain iron, folate and plenty of nitrates to keep us healthy. We all know that eating vegetables is critical to heart health and optimal physical performance. There are so many bioactive compounds found in green vegetables that we are just beginning to understand the importance of just a few of those compounds.

Spinach is also rich in a compound called betaine (bee-tuh-een) or trimethylglycine that helps build muscle, strength and power (577 mg per 100 grams). Betaine originally gets its name from beets, as it is manufactured from sugar beet molasses. Although beets have significant amounts of betaine, spinach and wheat germ are incredibly rich sources of betaine.

Betaine, like many other compounds found in plants (polyphenol antioxidants, vitamin C, etc.), serves a function of protecting the plant from environmental stress. Just as it helps plants, it can help animals and humans as well. Arguably, nothing is more stressful than an intense day in the gym while on a low-carb diet and twice-a-day cardio sessions. Are any of you doing that?

METHYL DONOR THAT COULD BE HEART HEALTHY

Betaine is essentially the amino acid glycine with

three methyl groups attached to it. This makes betaine a great "methyl" donor. There are many reactions in the body that require donation of a methyl group to one compound to make another metabolically active compound. For instance, creatine is made from the amino acids glycine and arginine; once combined, they are methylated. They are methylated by SAMe, a compound found naturally in the body that can be made by methylating homocysteine by betaine.

Some of you may remember from previous articles that elevated homocysteine levels in the blood have been correlated to cardiovascular disease, depression and inflammation in clinical studies. Since betaine can serve as a methyl donor to homocysteine, converting it to the essential amino acid methionine, betaine has the potential to reduce homocysteine levels in the blood. A Norwegian study has demonstrated

a correlation of high serum betaine levels and lower risk factors for heart disease.¹ Whether this correlates with a reduction in cardiovascular disease risk by betaine supplementation is yet to be elucidated by clinical science. However, the European Food Safety Authority (EFSA) allows claims that 1.5 grams of betaine per day can contribute to normal homocysteine metabolism.²

PROTEIN SYNTHESIS AND GENE HEALTH

The methylation process is not only very important in making active compounds like neurotransmitters for communication between nerves, but the process is also critical to the healthy function of our genes and protein synthesis. The methylation of proteins called "histones" allows our genes to be read to produce new proteins. Further, some proteins are methylated to change their structure and function. Without healthy methylation processes, our genes can be misread and this can lead to defective proteins or even cancer.

Beyond being a critical player in methylation processes, betaine is important in maintaining cellular hydration. This mechanism is very similar to the hydrating effects of creatine. Both creatine and betaine are osmolytes. Osmolytes are like sodium—they attract water. When betaine or creatine is shuttled into a cell, water goes with them. This gives the cell more resiliency, preserving structure and function in times of stress. It helps dilute metabolites and allows enzymes to function better. Betaine appears to stabilize proteins essential for metabolism in stressful environments.

BETAPOWER™ NATURAL BETAINE

Betaine supplementation has previously been shown to be a significant training aid, as it improved force production and muscular endurance in trained athletes.^{3,4} Interestingly, a number of studies show that feeding farm animals betaine increases muscle mass, and may even decrease fat mass with a concomitant rise in GH, IGF-1 and insulin. Researchers at the University of Connecticut have explored the mechanisms behind this performance enhancement.

So, betaine gives you bigger arms with a leaner body ... betaine for a beach body?

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SUPPLEMENT *performance*

To evaluate for the anabolic activity of betaine in humans, the researchers performed a randomized and double-blinded, placebo-controlled study with recreationally trained men who consumed 2.5 grams of BetaPower™ Natural Betaine per day for two weeks. Subjects then performed a series of exercises including vertical jumps, squats and bench presses, which were designed to elicit an anabolic response. Blood draws and muscle biopsies were performed to evaluate the effects of betaine on muscle, while anabolic hormones and muscle protein synthesis markers were measured.

The study showed that BetaPower™ Natural Betaine supplementation produced a 7.8 percent rise in IGF-1 levels and a 6.1 percent drop in the muscle-destroying hormone cortisol. The authors concluded that the cumulative anabolic effects of betaine accounted for the combination of increased IGF-1 and decreased cortisol after a stressful bout of exercise. They also found positive effects on the muscle protein synthesis-signaling pathways, and noted that betaine potentiated the intramuscular signal Akt. Overall, this data suggests a mild anabolic effect of betaine supplementation occurring through an endocrine mechanism, and coinciding with augmentation of intramuscular anabolic signaling.

Studies that demonstrate acute elevations in anabolic hormones don't always correlate well with potential for bodybuilding. However, another study evaluated muscle growth in the arms and legs in experienced weightlifters supplemented with BetaPower™ Natural Betaine at 2.5 grams per day during a six-week training program.⁵ Via skinfold and girth measurements, it was determined that betaine improved arm muscle size without significant improvements in leg muscle growth. Furthermore, betaine supplementation appeared to improve body composition in these subjects, with increased muscle mass and lower body fat percentages. So, betaine gives you bigger arms with a leaner body.

COMBINING CREATINE AND BETAINE

It has been thought that perhaps consuming creatine and betaine together could provide an additive effect on muscle performance. A study looked for this effect by supplementing untrained subjects with two grams of betaine per day or 20 grams of creatine per day, or a combination of both, for 10 days.⁶ Certainly, the groups that received creatine showed significant improvements in squat and bench press power, and strength output. Unfortunately, the group that received two grams of betaine alone showed no improvement in strength or power, compared to the placebo group. Further, betaine was not additive to the effects of creatine. It is possible that these results are due to lower

betaine dosing, a failure of effect in untrained subjects or even a shorter 10- versus 15-day supplementation time.

It is possible that some of the ergogenic effects are not related to muscle function at all. It may be effects on perceived exertion, fatigue, thirst and thermal sensations. It is true that when we have more thirst or feelings of increased temperature, our motivation decreases and feelings of exertion increase, leading to performance deficit. Armstrong and colleagues showed that BetaPower™ Natural Betaine reduced thirst and thermal sensations during the final sprint after 75 minutes of running.⁷ Hoffman et al. further reported that BetaPower™ Natural Betaine supplementation (2.5 grams) reduced perceptions of fatigue during high-volume training and was shown to significantly increase anaerobic power and strength in the bench press and squat after 15 days of supplementation.⁸

SCIENCE SUPPORTS BETAINE FOR IMPROVED PERFORMANCE

In conclusion, there is science to support the betaine found in many supplements today. It appears to improve body composition and performance in the gym. Beyond its value for the physique athlete, it does appear that betaine may provide health benefits similar to having a diet rich in the vegetables and whole grains in which it is found. Better cardiovascular health and inflammatory modulation may lead to improvement in the performance of everyday life as we age. ■

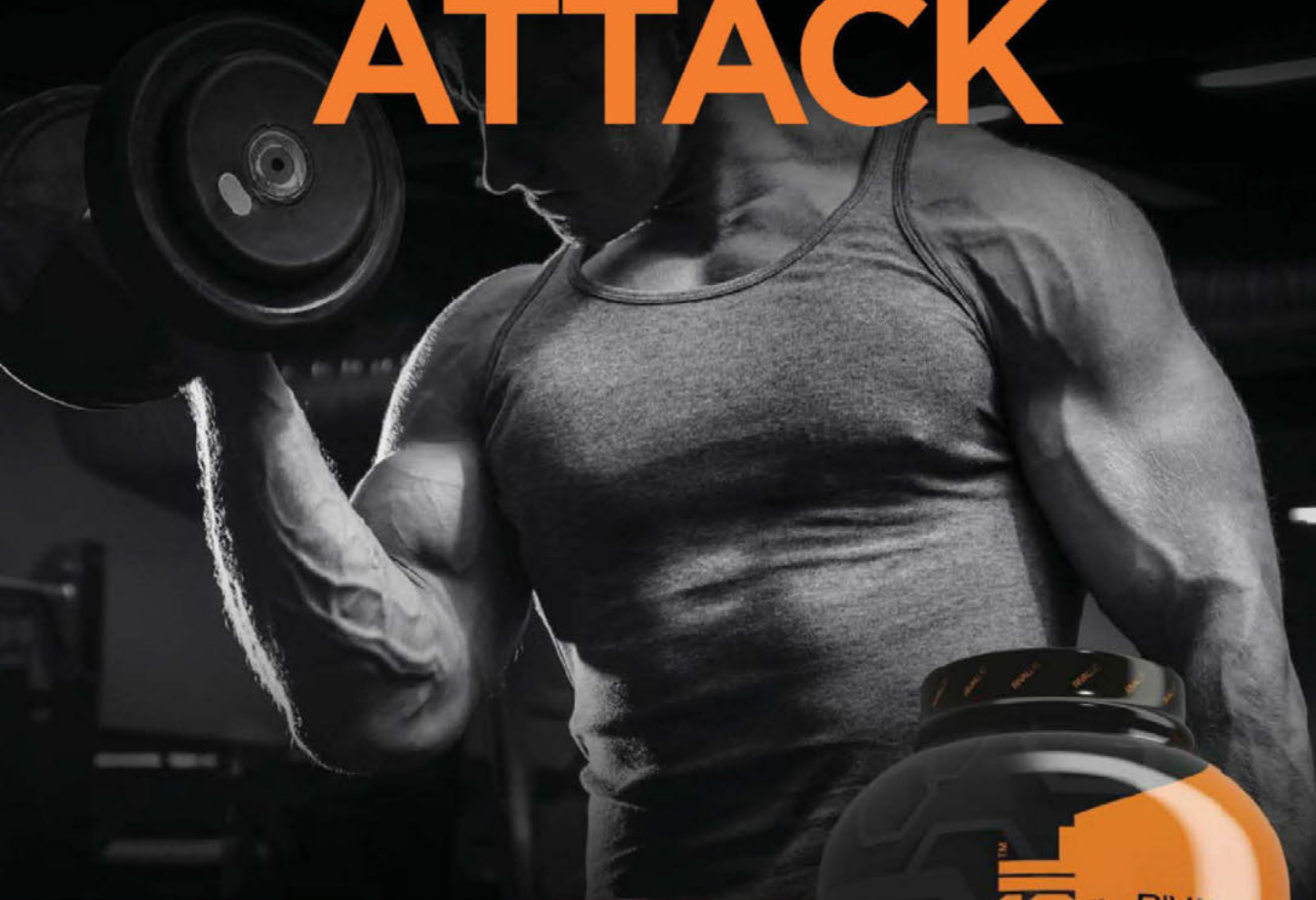
Dr. Victor Prisk is a board certified orthopaedic surgeon and IFBB professional bodybuilder in Pittsburgh, PA. Dr. Prisk is an active member of the GNC Medical Advisory Board and creator of the "G.A.I.N. Plan." He is an NCAA All-American gymnast, champion swing dancer and NPC Welterweight National Champion.

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With the Lynx Board, you are training with a carefully tested friction between a plate and a set of pads. The patented friction technology uses your own weight to provide counter-resistance as your body glides in rhythmic precision along the specially engineered surface. As a result of resistance-controlled friction, there is virtually no impact, which makes the training advantageous for people recovering from injury or those who have chronic joint problems such as osteoarthritis.

You control your movements and your results on the Lynx Board by tweaking your



training techniques and adjusting the number of sets, repetitions, speed, range of motion and your individual static stabilization. Friction makes the precise control of movement easy to maintain, and range of motion cannot exceed the level of your individual muscular performance. The patented Lynx Board surface responds to your bodyweight by increasing the intensity of the workout proportionately to the pressure you exert.

In short, the Lynx Board conforms to your fitness level and abilities, and challenges you while giving you the best workout possible.

BUILD YOUR CORE

One of the preeminent developments in fitness in the last decade has been the increased appreciation for core strength and the many benefits that it bestows. The core refers to your back, pelvis and shoulder girdle, the four bones that support the muscles and ligaments in your shoulders. When your core is strong, you have improved functional fitness, with better performance and balance in sports and all activities of daily living. You

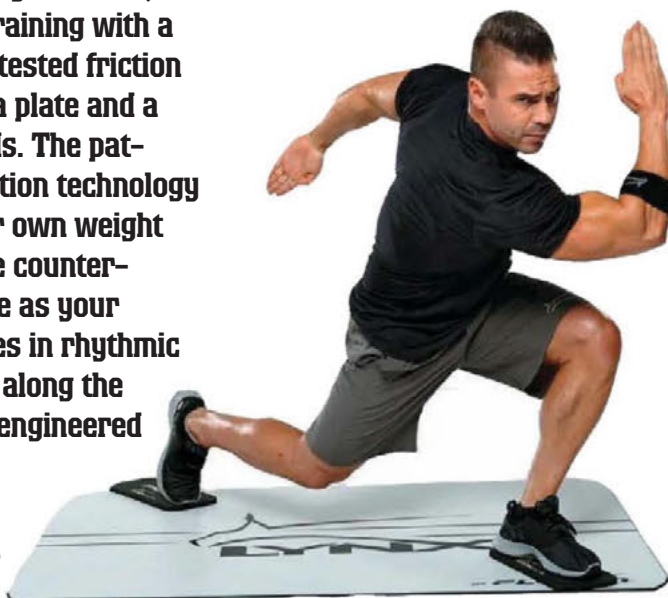
also are less prone to injuries and suffer fewer aches and pains.

The Lynx Board has been scientifically shown to improve your core strength in just a few minutes per day. In a recent study, the Lynx Board was found to significantly improve core musculature endurance and strength. Researchers concluded that both static and functional core strength can be improved by training with the Lynx Board.

Good core stability is critical to good posture, and provides an excellent foundation for the arm and leg movements that can counter the effects of poor posture and back problems so prevalent in our technology-driven lifestyles. So, if you spend too many hours in front of a computer every day, the Lynx Board could be just the relief you need to ease your aches and pains and improve your athletic performance. And remember, if you’re too beat to head to the gym after work ... no problem. Just set up the Lynx Board in your living room and you’re good to go. ■

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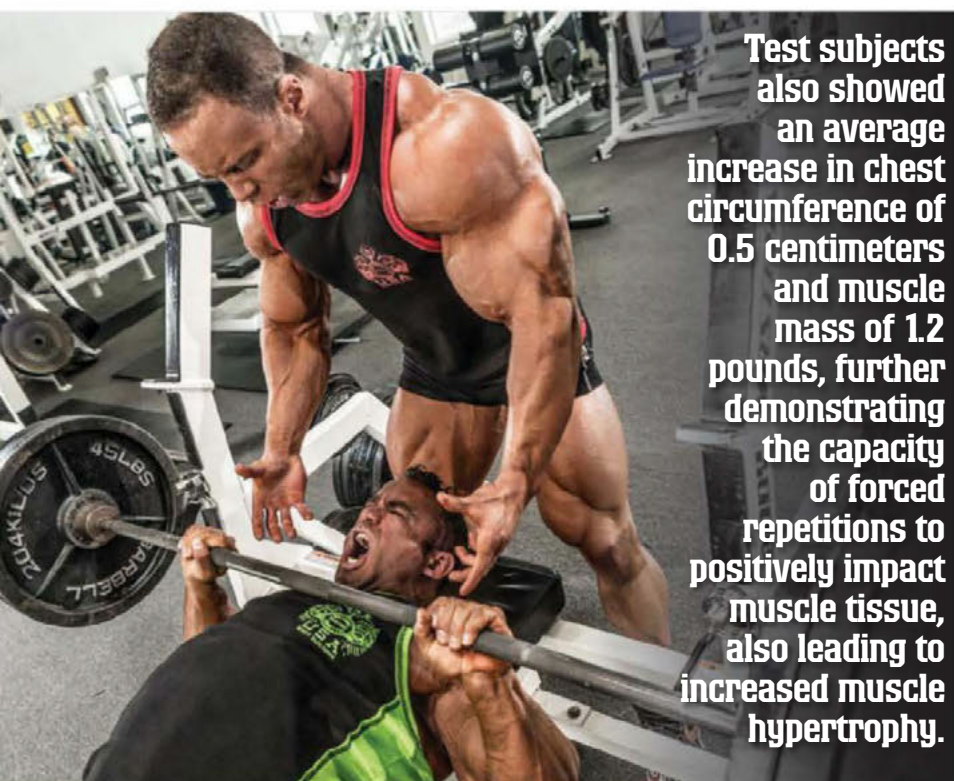
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Test subjects also showed an average increase in chest circumference of 0.5 centimeters and muscle mass of 1.2 pounds, further demonstrating the capacity of forced repetitions to positively impact muscle tissue, also leading to increased muscle hypertrophy.

Advanced weightlifting techniques manipulate specific training variables such as load, sets and repetition range, in order to more efficiently improve muscle size and strength. One of the more well known and widely used advanced training methods is the forced repetition¹, which involves assistance from a spotter to perform additional repetitions during the concentric phase of the lift, after muscular failure has occurred from the previously performed repetitions within the set.

Despite the popularity of forced repetitions, there is a shortage of scientific evidence supporting the ability of forced repetitions to enhance strength. In fact, one of the few studies out there looking at the impact of forced repetitions on strength actually suggests that forced repetitions may not promote strength at all. Furthermore, there are only a few studies supporting the use of forced repetitions to trigger muscle growth.

So, why is this training method so popular when the science supporting its effectiveness is so weak? Well, that is probably because this training method does boost size and strength— but science just hasn't done the right set of experiments yet, particularly when it comes to strength increases, to support the notion that forced repetitions can accelerate muscle growth and strength.

FORCED REPETITIONS AND STRENGTH GAINS

One of those hard-to-find studies investigating the impact of forced repetitions on strength actually indicated that this training approach can, in fact, improve strength.² That conclusion can't be derived directly from the results of this study, because the experimental setup used in this investigation had all 22 test subjects perform forced repetitions during the bench press, albeit to different degrees— thus impeding the capacity to uncover the precise impact of forced repetitions on strength gain, as there

was no negative control group that was unexposed to the impact of forced repetitions on bench press strength.

Nevertheless, the results of this study did show that all groups increased bench press strength by an impressive amount of approximately 10 pounds, with no significant differences in strength gains between any of the groups, despite the fact that some groups did more forced repetitions than others. So, the authors of this study rightfully conclude that performing more forced repetitions does not lead to greater improvements in bench press strength.

However, the authors never state that forced repetitions do not improve strength levels, as that conclusion can't be drawn from this data. As a matter of fact, when considering that the strength gains in this study were so significant and all of the test subjects were well-trained athletes with extensive weightlifting experience, making these large strength gains even more notable, it is plausible to suggest that forced repetitions can enhance strength. A more focused study with the right control groups would clearly strengthen this proposal.

In addition, all test subjects also showed an average increase in chest circumference of 0.5 centimeters and muscle mass of 1.2 pounds, further demonstrating the capacity of forced repetitions to positively impact muscle tissue, also leading to increased muscle hypertrophy.

SPIKE ANABOLIC HORMONES WITH FORCED REPETITIONS

If you've ever done forced repetitions, which I'm sure most MD readers have, then you'll know that this form of training is extremely intense, requiring a tremendous amount of rapid energy production via anaerobic respiration. The heavy reliance on anaerobic energy production ultimately results in greater production of the primary metabolic byproduct of anaerobic respiration, lactic acid.

The accumulation of lactic acid subsequently triggers a strong anabolic-hormonal response that contributes to the muscle-building effect of forced repetition training as seen, for instance, in the previously mentioned study by Drinkwater et al.² That is because lactic acid triggers an increase in the two most prominent muscle-building hormones, growth hormone (GH) and testosterone. In fact, a study by Ahtiainen et al. clearly showed test subjects performing forced repetitions not only increased the production of lactic acid³, but they also showed much higher GH levels shortly after working out, relative to the control group that performed a similar training routine that did not include forced repetitions.

A second study by Ahtiainen et al.⁴ also found that testosterone levels increased in all test subjects that performed forced repetitions. Interestingly, they noticed that the increase in testosterone levels was actually much greater for test subjects that had a

FORMULA 19

The origin of this product dates all the way back to the 90's. At a very young age, I was mentored by a brilliant man, and I don't use the word brilliant loosely. This mentor happened to be a bodybuilder who was also pioneering a customized degree program from UConn based around Exercise Science and Chemistry. This gentleman was the first to preach the importance of the Anabolic Window to me. It is at times argued, but universally understood, that within 60 minutes post-workout, your body becomes a nutritional black hole. Your body is ready to suck up everything like a sponge. While training hard, you burn up all of your glycogen and stored nutrients, and afterwards your blood sugar is low, leaving your body starving for nutrient-rich recovery.

I have dedicated my body to science for years, data collecting, and trying every possible post-workout concoction under the sun because of this theory. I have tried all sorts of carb sources from grape juice, to sports drinks, to pure dextrose, and more recently, highly-branched cyclic dextrin. I have tried every single amino acid product known to man in every single dose possible. After 19 years of trial and error, I came up with a formula that kept my pumps for hours and accelerated my recovery, as well as dramatically reducing soreness. This concoction consisted of 5 key elements that I was buying separately and mixing together. I began passing my findings on to hundreds of clients who were either speechless, or overjoyed at what was happening to their bodies. I had what I called "The ultimate post-workout concoction" and I was always excited to share it. I had this figured out when I first started Blackstone Labs, but it wasn't until 3 years later where a fan, who had gotten some advice from me on periscope, reached out to me via email to tell me "Thank you so much, this concoction has been amazing! When will Blackstone Labs be putting this out?"

EUREKA! How could I not put this out? In an industry selling where products with crazy one-word, action-packed names is the norm, I decided to just name the product after the amount of time it took me to discover it... It literally took me 19 years to find this perfect recipe for success and the name has to mean something to me. So to keep it simple, I give you: Formula 19.



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MUSCLE GROWTH *update*

history of strength training, when compared to the group of test subjects with no strength training experience, indicating that this very high-intensity training technique may be more appropriate for those with extensive weightlifting experience.

TOO MANY FORCED REPETITIONS MAY CAUSE OVERTRAINING

In addition to elevating the quantity of the anabolic hormones GH and testosterone, forced repetitions also triggered the release of the muscle-depleting hormone cortisol in the two above-mentioned studies by Ahtiainen et al.^{3,4} This is an important finding, because cortisol stimulates protein degradation while inhibiting protein synthesis, which in due course can inhibit muscle growth.^{5,6} As a result, the increased level of cortisol induced from the use of forced repetitions could mitigate some, or all, of the muscle-building effect that forced repetitions provide.

Each study also showed that forced repetitions caused a greater amount of muscular fatigue, when compared to subjects who did not do forced repetition work. Moreover, greater muscular fatigue was much more pronounced in subjects with less training experience, which once again indicates that this training

method appears to be better suited for the experienced lifter.

Altogether, the greater extent of muscular fatigue and cortisol triggered by forced repetition training most certainly increases the likelihood of overtraining, especially if the use of forced repetitions is excessive, as this would likely result in more cortisol release and muscular fatigue—which together can significantly deplete muscular performance and lead to overtraining.

Also, remember the study by Drinkwater et al.² showing that more forced repetitions did not result in superior gains of strength. Therefore, like any other advanced training method, forced repetitions should be used somewhat sparingly, especially for novice lifters, meaning as infrequently as a few training sessions per month where you merely add a few sets of forced repetitions to a few key movements that are amenable to forced repetition training. Examples of movements that are good candidates for forced repetition training would be the bench press or squat, as these movements can be effectively assisted by a spotter. Forced repetitions should also be gradually added to any training regimen.

Finally, after adding forced repetitions to your workout, pay attention to the early warning signs of overtraining (e.g., decreased exercise performance, delayed muscle recovery and low energy levels) and adjust the frequency of this

technique accordingly to reduce the chance of overtraining, while still maintaining the strong training stimulus afforded by forced repetitions that should produce considerable gains in muscular size and strength. ■

For most of Michael Rudolph's career he has been engrossed in the exercise world as either an athlete (he played college football at Hofstra University), personal trainer or as a research scientist (he earned a B.Sc. in Exercise Science at Hofstra University and a Ph.D. in Biochemistry and Molecular Biology from Stony Brook University). After earning his Ph.D., Michael investigated the molecular biology of exercise as a fellow at Harvard Medical School and Columbia University for over eight years. That research contributed seminally to understanding the function of the incredibly important cellular energy sensor AMPK—leading to numerous publications in peer-reviewed journals including the journal *Nature*. Michael is currently a scientist working at the New York Structural Biology Center doing contract work for the Department of Defense on a project involving national security.

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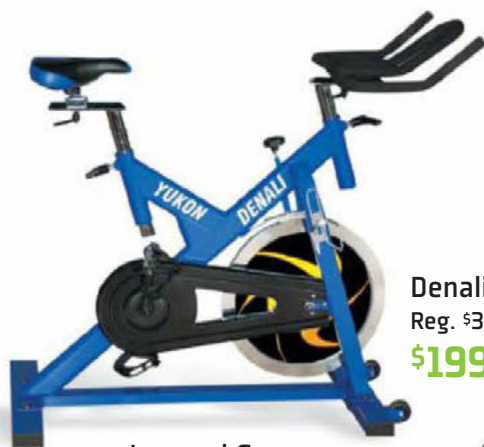
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IS THERE AN OPTIMAL REST INTERVAL FOR MUSCLE GROWTH?



It is well established that proper manipulation of resistance-training program variables is necessary to maximize muscular adaptations.^{5,8} But while variables such as volume, repetition range and training frequency tend to get the majority of attention in program design, an often-overlooked factor is the rest interval, defined as the time taken between sets and exercises. Current theory suggests that long rest intervals are superior for maximizing strength

increases, while short periods of rest are better for driving hypertrophy. From a strength standpoint, the reason for using longer rest intervals is to enhance recovery.⁵ Your energy reserves are necessarily taxed after a heavy lift. Logically, the longer you take between lifts (at least up to a certain threshold), the more you'll be able to maintain your strength levels on the ensuing set. Research shows that, following an all-out set in a moderate rep range, strength is fully

recovered after about three minutes rest.¹¹

Alternatively, current guidelines for maximizing muscle growth recommend that rest intervals be kept to around a minute in duration. This recommendation is largely based on the fact that short rest periods lead to heightened metabolic stress, which manifests in the accumulation of metabolites, particularly lactate, inorganic phosphate and hydrogen ion. Limiting the time taken between sets does not allow the

body adequate time to reestablish homeostasis, resulting in an increased accumulation of these metabolites.¹ There is evidence that high levels of exercise-induced metabolic stress drives muscle growth through a variety of potential mechanisms.⁹ This provides a theoretical basis whereby shorter rest periods promote greater anabolism.

Despite this apparently sound rationale, previous studies on the topic have been conflicting. Ahtiainen et al.² showed no differences in hypertrophy between two- versus five-minute rest periods. Conversely, Buresh et al.³ found that a rest period of 2.5 minutes produced greater growth in the arms compared to those who rested one minute. Further confounding matters, Villanueva et al.¹⁰ reported superior increases in lean body mass when training with one- versus four-minute rest periods. Trying to reconcile discrepancies between these studies is difficult, given the differences in their methodology. For example, the Ahtiainen et al.² study used well-trained young men, Buresh et al.³ used untrained young men and Villanueva et al.¹⁰ used untrained elderly men. Moreover, the actual length of the rest periods varied substantially between studies, as did the methods used to measure muscle growth (Ahtiainen et al.² was the only study to directly assess hypertrophy—the others employed indirect measures of growth). To provide greater clarity on the topic, I recently collaborated on a study with researchers at Oklahoma State University that investigated the effects of rest intervals on muscular adaptations.⁷ As opposed to previous studies, we studied the generally accepted guidelines for strength and hypertrophy as the basis of the protocol.

Here are the specifics.

We recruited 21 college-aged, resistance-trained men and randomized them to a routine that afforded either one or three minutes rest between sets. Everything else about the routines was exactly the same. Subjects performed a total-body routine working all the major muscle groups, each workout with three sets of eight to 12 reps per exercise. Training was carried out three days a week for eight weeks. All sets were taken to the point of concentric muscular failure. Direct assessments of muscle growth were made using B-mode ultrasound.

The results?

As would be expected, there was a clear benefit to using longer rest intervals from a strength perspective; significantly greater increases in one-repetition maximum (1RM) were noted in both the squat and bench press. No real surprise there. However, contrary to current hypertrophy guidelines, the data suggested that longer rest periods were beneficial to muscle growth, as well. Overall, greater increases in size were seen in the biceps,

triceps and the frontal thigh in those taking three minutes between sets compared to one minute; statistical analysis of effect sizes indicated that the differences between conditions were meaningful.

Why might longer rest intervals build more muscle? While we can't say for sure, it can be speculated that reductions in volume load (i.e., sets \times reps \times load) are a primary factor in the outcome. There is a clear dose-response relationship between volume and hypertrophy—up to a given point, higher volumes of training lead to greater muscular gains.⁶ In our study, total volume load was approximately 13 percent higher with the use of three-minute rest intervals. Simply stated, the longer rest allowed subjects to maintain a higher percentage of their load, resulting in a greater total volume load over time, which seemingly enhanced muscle growth.

There was a clear benefit to using longer rest intervals from a strength perspective; significantly greater increases in one-repetition maximum (1RM) were noted in both the squat and bench press. The data suggested that longer rest periods were beneficial to muscle growth, as well.

In putting these findings into context with previous research, it would seem that a rest interval of at least two minutes would be advisable to optimize the hypertrophic response. This is consistent with the results of Ahtiainen et al.²—the only other study to directly investigate muscle growth in well-trained subjects—which found no differences in hypertrophy between two- and five-minute rest intervals. When combined with our findings, it therefore can be extrapolated that taking two minutes between sets is sufficient to maintain volume loads that maximally drive muscular gains.

Now, does this mean short rest intervals should never be employed in a hypertrophy routine? Not necessarily.

As mentioned, decreasing the rest period between sets blunts the clearance of metabo-

lites from the muscle.¹ It stands to reason that consistently training in such a manner would lead to adaptations that improve buffering capacity, potentially enhancing your ability to increase the number of repetitions performed at a given moderate-rep load. There is evidence that such adaptations due indeed take place⁴, providing a basis whereby this would lead to higher volume loads over time and thus greater muscular gains.

There are a number of ways to put this information into practice. Perhaps the most logical strategy—and one that I've employed with high-level physique competitors—is to rest two minutes or more on all the major compound lifts such as squats, presses and rows. These exercises cause major metabolic disturbance, and thus require longer rest to fully recuperate the energy needed to sustain volume load across sets. You can then shorten rest periods to a minute or so for single-joint movements such as flyes, curls and leg extensions. Since these movements are less metabolically taxing, you'll recover quicker while getting the benefit of enhancing the buffering capacity in muscle. It's an evidence-based approach that should translate into greater gains over time. ■

Brad Schoenfeld, Ph.D., CSCS, FNSCA is widely regarded as one of the leading authorities on training for muscle development and fat loss. He has published over 80 peer-reviewed studies on various exercise- and nutrition-related topics. He is also the author of the best-selling book, *The M.A.X. Muscle Plan*, and runs a popular website and blog at www.lookgreatnaked.com.

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UCPI causes the utilization of fatty acids from stored body fat, instead of ATP from muscle tissue. This unique fat-burning mechanism of UCPI and brown adipose tissue is one of the key fat-burning actions and benefits of PHENBUTEROL. While other companies rely on stimulants from outdated pathways to burn fat, MuscleMeds is the first company in the industry to create a supplement targeting the activation of UCPI and BAT.

NOT YOUR GRANDMOTHER'S FAT BURNER

Now, when I heard about PHENBUTEROL, I couldn't wait to see what it was all about. In fact, it was designed to burn fat from multiple angles, making it vastly superior to other products. Let's take a look at a few of the ingredients in PHENBUTEROL and why the synergy between them makes it so powerful.

GRAINS OF PARADISE

Grains of Paradise (*Aframomum melegueta*) is a spice native to West Africa. MuscleMeds uses 6-paradol, a highly standardized component of *Aframomum melegueta*. This is the most potent form in existence in its ability to transform your body from flab to fabulous. It has been shown to activate BAT and increase whole-body energy expenditure. It can increase the reduction of body fat through activation of BAT as well as thermogenesis, making it one amazing compound. This gives you a one-two punch in your fat-burning battle.

CAFFEINE

We all know that caffeine is a central nervous system and metabolic stimulant. Studies have shown it can increase energy and reduce fatigue. It is also popular for its ability to improve clarity and mental concentration. Most importantly, it contributes to increasing the process of lipolysis. It does this by helping to mobilize fatty acids to aid in fat burning. This is a two-fold process. First there is the increased metabolism by raising resting energy expenditure, but even more important is the activation of BAT.



RAUWOLFIA SERPENTINA

This powerful herb acts primarily as an alpha-2 antagonist. Alpha-2 receptors hinder the release of norepinephrine, and are very anti-lipolytic. It is harder for the fat to break down in stubborn fat areas when alpha-2 receptors are in abundance. This powerful compound acts to help suppress alpha-2 receptors. When this happens, it allows the release of norepinephrine. This leads to fat burning from two pathways. By blocking the alpha-2 receptors, it helps maximize the powerful thermogenic effect. When norepinephrine is released, BAT can be activated so you burn fat like a furnace. This, in turn, promotes lipolysis, which can help you slash fat in some of the most problematic areas like the waist, glutes and hamstrings.

BURN FAT FAST!

Once again, the scientists at MuscleMeds outdid themselves. They created the ultimate fat-burning agent that leaves other products in the dust. While other companies rely on outdated ingredients, MuscleMeds constantly looks for the most cutting-edge research to bring you nothing but the best. PHENBUTEROL's combination of several thermogenic agents makes it unbeatable, and a valuable asset in the war on burning unwanted fat. If you are looking to get in the best shape of your life, then look no further. PHENBUTEROL is your secret weapon for obliterating fat and taking your physique to a whole new level.

For more information, visit musclemedsrx.com. ■

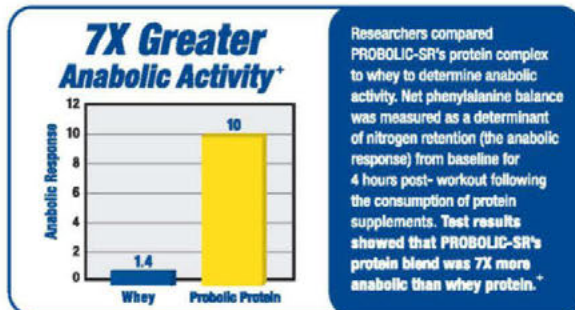
7X Clinical Study Reveals Sustained Release Protein Blend Is MORE ANABOLIC THAN WHEY!

A New Groundbreaking Clinical Study* On Protein Reveals That MHP's ProBolic-SR Is Superior To Whey For Building Lean Muscle Mass!

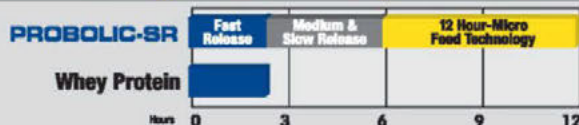
MHP's ProBolic-SR, the world's first combination protein supplement of its kind, is formulated to provide fast, medium and slow releasing proteins in one advanced formula. The combination of these precise muscle building proteins provide far greater anabolic and anti-catabolic benefits than any other single protein supplement.

7X Greater Anabolic Activity*

This recent landmark study confirms that consuming a blend of proteins as found in ProBolic-SR provides a fast releasing whey, medium releasing soy isolate and slow releasing casein, thereby supplying a prolonged delivery of amino acids to the muscles for 7x greater anabolic activity.* This combination increases the "anabolic window," making ProBolic-SR superior for consumption following resistance exercise versus whey protein alone.

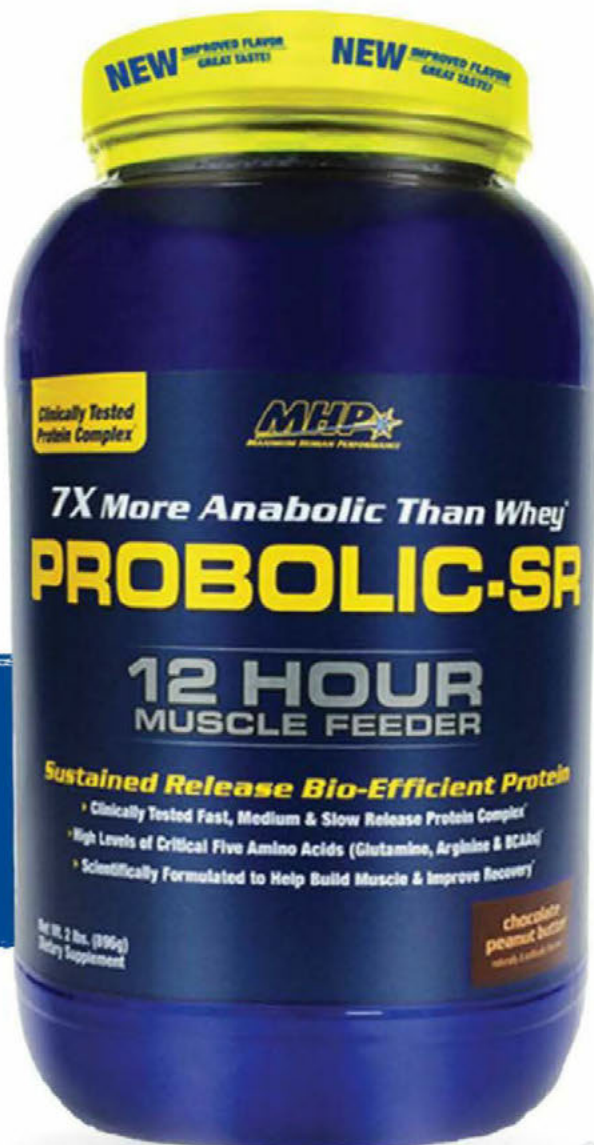


When Other Proteins Stop Working, PROBOLIC-SR Keeps Feeding Muscle Tissue For Up To 12 Hours!



PROBOLIC-SR's combination of fast, medium and slow release proteins and 12 Hour Micro-Feed Technology makes it the perfect muscle building protein for pre-workout, post-workout, between meals and before bedtime.

- Clinically Tested Fast, Medium & Slow Release Protein Complex
- High Levels of Critical Five Amino Acids (Glutamine, Arginine & BCAAs)
- Scientifically Formulated to Help Build Muscle & Improve Recovery



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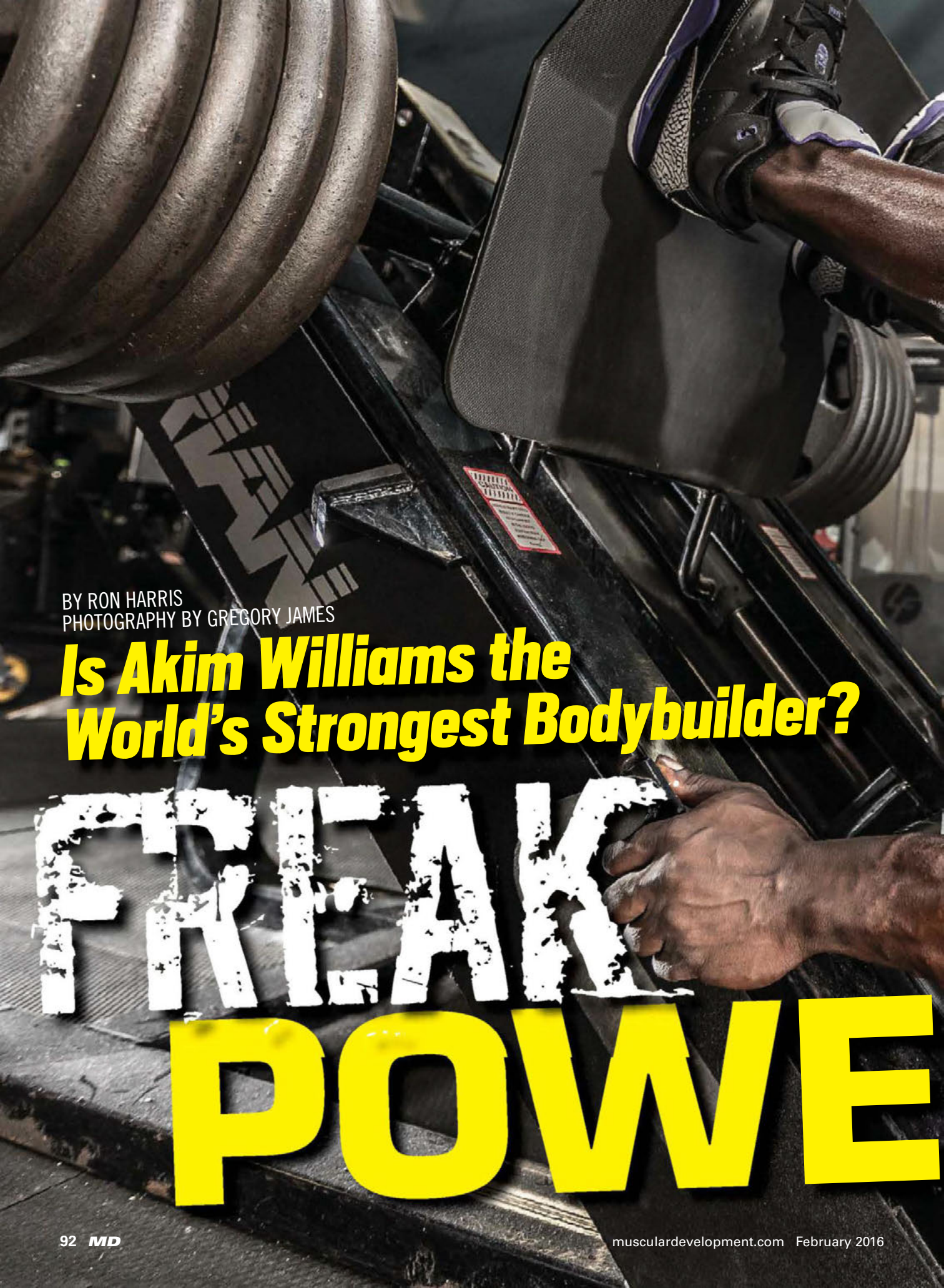
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*"Soy"-dairy protein blend and whey protein ingestion after resistance exercise increases amino acid transport and transporter expression in human skeletal muscle," *Journal of Applied Physiology*, April 3, 2014.

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BY RON HARRIS
PHOTOGRAPHY BY GREGORY JAMES

Is Akim Williams the World's Strongest Bodybuilder?

FREAK POWER



R

BIG IS GOOD, BIG AND STRONG IS BETTER!

If you want to get technical about it, being particularly strong means nothing in competitive bodybuilding. The weights a bodybuilder uses are merely tools, a means to an end to build his physique. The sport is judged by the appearance of the physique in terms of factors such as mass, shape, proportion, symmetry and condition. It doesn't matter who can squat, bench press or deadlift more weight, or who is stronger in general. Those factors are everything in powerlifting and Olympic lifting, as well as Strongman competition—sports that focus on numbers in pounds, and where the way a man is built is irrelevant.



Sometimes, we encounter a genetic freak who can harness the best of both worlds. And bodybuilding fans have always reserved an extra level of respect for those champions who had shocking strength to go along with their extreme muscle mass: men like Franco Columbu, Casey Viator, Dorian Yates, Ronnie Coleman, Johnnie Jackson and Branch Warren, to name a few. Conversely, some bodybuilding stars have been held in disdain for not being as strong as they looked, or for not training as heavy as some fans felt they should. Phil Heath

has five Mr. Olympia titles and counting, but many fans jeer his “pussy” workouts because he avoids free-weight power movements like the bench press, squat and deadlift. I have always theorized that this is partly because more fans happen to be able to develop greater strength than they can muscle mass, as the genetics for being able to grow truly enormous muscles are rare indeed.

Whatever the reason, fans embrace bodybuilders who can display elite strength to go along with their elite development. Akim Williams definitely

fits into this category. At 300 pounds in the off-season at 5'10" and 260 pounds onstage, the new pro packs some of the thickest, most dense muscle in the IFBB today, with 23½-inch arms and monster legs that are especially ridiculous. Many have compared his physique to '80s mass monster Victor Richards.

A FORESHADOW OF GREAT POWER TO COME

You can't always spot exceptional bodybuilding potential in untrained men. Sometimes you would never guess

LEG ROUTINE

Lying Leg Curls	5 x 20
Leg Extensions (as warm-up)	4-5 x 20, each leg
Squats	Warm-ups: 135 x 12, 225 x 12, 315 x 12 Sets: 405 x 10-20, 495 x 10-12, 585 x 7-8
Leg Press	3-4 x 30-40
One-leg Vertical Leg Press	5 x 10-12 per leg
One-leg Leg Extensions	5 x 15-20 per leg

CHEST ROUTINE

Incline Bbarbell Press	6 x 15, 12, 10, 10, 8, 6, 3
Flat Barbell Press	4-5 x 10-12
Hammer Strength Decline Press	4 x 10-12
Seated Bench Press Machine	4 x 10-12
Pec Flye Machine	4 x 15-20

FANS EMBRACE BODYBUILDERS WHO CAN DISPLAY ELITE STRENGTH TO GO ALONG WITH THEIR ELITE DEVELOPMENT. AKIM WILLIAMS DEFINITELY FITS INTO THIS CATEGORY.

it was there, dormant, as the person displays nothing special physique-wise until they start training. Strength is different, as it seems to be based more on neurological efficiency and tendon strength, both of which are present before a person starts to train. Many people who go on to display incredible strength are typically naturally strong to begin with. So it was with Akim Williams. While earning his degree in computer science at the Brooklyn campus of Long Island University, a friend asked him to accompany him to the school gym, mainly to spot him. He'd never touched a

weight yet, and was a mere 147 pounds at the time. That very first day, he trained chest with his friend, and shocked both of them when he was able to lift more on the bench press.

"I got 225 for six," Akim recalls. His legs turned out to be even stronger. "I was afraid to even try squats, because I had heard they were really bad for your knees," he says. "Honestly, the first few months in that weight room, all I did was bench press because it was all I cared about."

Eventually, he decided he might as well try training his legs, and got under

a squat rack. "I started out light. But the lighter weights felt like nothing for me, and my knees didn't hurt, so within a month I was doing 315 for 10 reps." This was when Williams was 21 years old, and at the time he had zero interest in bodybuilding, or even trying to get bigger, for that matter. "My thing was that I wanted to have a big bench press," he tells us. "My goal was to be able to bench four plates, or 405." He benched three times a week, but those four plates still took time to reach. One consolation was that within a year, he was doing 315 for reps at 170 pounds, the same as a guy



there nicknamed 'Hercules' who was the strongest man there, and who weighed 270. "It took me longer than I expected to get that 405, about a year and a half of lifting." He relates this with disappointment, oblivious to the fact that most men never bench 405 no matter how many years they train!

LOW REPS CAN'T BUILD SIZE? UH, OK ...

You've read it in bodybuilding magazines a thousand times: very low reps only develop strength. They don't cause muscle growth. For that, you need slightly higher reps, and more time under tension. That may be true for most men, but there are exceptions. Akim may never have discovered he was one of those rare cases, had it not been for a man in the weight room named Ken but called "Coach T," who had played professional hockey in his younger years and set a record for the bench press in the over-65 division in the state of Florida.

"Coach T told me lower reps are what build thick, dense muscle mass, and it made sense to me," he says. "Look at guys like Ronnie, Dorian and Kai—they all trained very heavy and they had a different look because of it." How low do his reps go? For most of the basic free-weight exercises, he sticks to a rep range of three to six. Only on arms will he use higher reps for a better pump, but that might be beside the point, as his arms grow so easily that he often goes weeks without training them.

You would be astute to wonder if more standard rep ranges might give Akim even better results. In the off-season—after turning pro at the 2013 North American, and all the way up until his pro debut in May 2014 at the New York Pro—Williams trained with his good friend Juan Morel, and gave Diesel's higher rep scheme a solid go.

"For me, going a little lighter and doing more reps actually made me look worse," Akim states. "I lost that dense, hard look my muscles had, and I got 11th place." Immediately, Akim decided to return to

ARM ROUTINE

Biceps

Preacher Curl Machine	6 x 8-20
"Opposite" Preacher Curl Machine	6 x 8-20*
"Front Double Biceps" Cable Curls	4-5 x 15-20

Triceps

Rope Pushdowns	4-5 x 8-20
V-Bar Pushdowns	4-5 x 8-20
Seated Triceps Extension Machine	4-5 x 8-20

**After doing his sets the standard way on the preacher curl machine, Akim gets up and out of the machine, positioning himself as if he were giving someone else forced reps on it. There, he does several sets of partial reps.*

his usual tendon-straining poundage and lower reps. Just a couple of months later, he cracked the top five at the Chicago Pro, and he scored two top-three finishes in the 2015 season. "I went from 150 to over 300 pounds in about seven years by training very heavy," he says. "It might not work for everyone, but it definitely works for me."

NO SUPPORTIVE GEAR FOR THIS FREAK

These days, you hardly ever see a guy doing 30-pound dumbbell curls without a weight belt on. You sure don't see anyone squatting without a belt, and most guys piling on the plates over at the squat rack will also wrap their knees up tightly before getting under the bar. It almost boggles the mind to learn that Akim uses neither, in light of the insane weights he moves in the gym.

"For one thing, I feel they restrict your body's movement," he notes. "And when you rely on all that supportive gear, your own tendons and ligaments never get any stronger. I honestly feel you are in more danger of injury in the long run using those things."

The only accessory item Akim will utilize is wrist straps to reinforce his grip on his heaviest sets on back day. "I don't have a problem with that because I'm not trying to have the strongest grip in the world, I'm trying to improve my back."

IS AKIM THE WORLD'S STRONGEST BODYBUILDER?

Akim himself has never claimed to be the world's strongest bodybuilder, and we at MD aren't claiming he is, either. A good



"I WENT FROM 150 TO OVER 300 POUNDS IN ABOUT SEVEN YEARS BY TRAINING VERY HEAVY. IT MIGHT NOT WORK FOR EVERYONE, BUT IT DEFINITELY WORKS FOR ME."

CONTEST HISTORY

2010 Bill Grant Classic	Novice Winner
2010 Brooklyn Grand Prix	Heavyweight Winner
2010 Eastern USA	Light Heavyweight winner
2011 Junior Nationals	Fourth, Heavyweight
2011 IFBB North American	11 th , Heavyweight
2012 Eastern USA	Super Heavyweight and Overall Champion
2012 USA Championships	Fifth, Super Heavyweight
2012 NPC Nationals	Ninth, Super Heavyweight
2013 IFBB North American	Super Heavyweight and Overall Champion
2014 New York Pro	11 th Place
2014 Chicago Pro	Fifth Place
2014 Golden State Pro	Seventh Place
2015 Chicago Pro	Third Place
2015 Tampa Pro	Eighth Place
2015 Europa Dallas	Third Place





AKIM'S BEST GYM LIFTS

Barbell Bench Press	495 x 5
Incline Barbell Press	495 x 5
Deadlifts	840 x 2
Squats	765 x 3
Barbell Rows	495 x 6
Dumbbell Rows	200 x 6
Leg Press	2,300 x 5

case for that title would be Stan "Rhino" Efferding, who is now the greatest raw powerlifter of all time, after having broken the record set by powerlifter Jon Cole that had stood since 1972. But although Stan has already earned his place in powerlifting history, he never did set the world of pro bodybuilding on fire. In four outings as a pro, he only managed to crack the top 10 once.

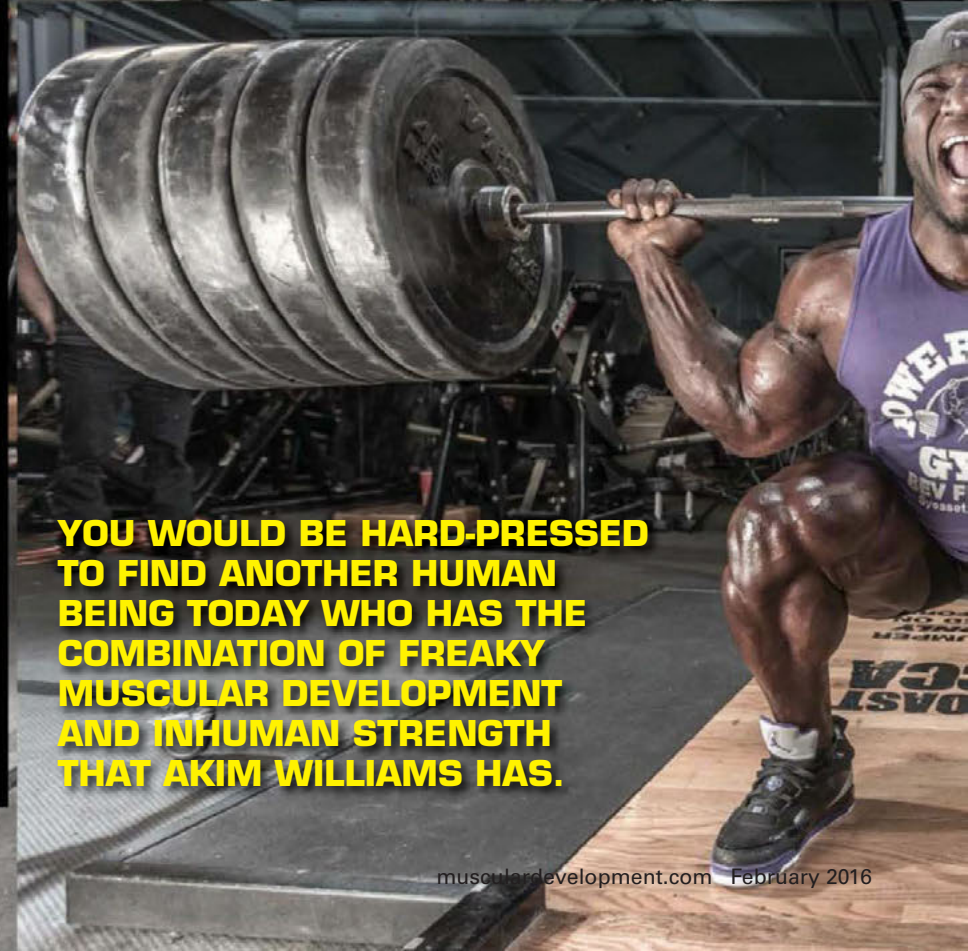
Perhaps another argument could be made for Johnnie Jackson, who pulled an 832-pound deadlift in a raw powerlifting meet, has won three pro bodybuilding contests and has landed in the top five on 30 other occasions. If you want to talk pound-for-pound strength, you might have to go with two-time Mr. Olympia Franco Columbu back in the 1970s. At 185 pounds, he could deadlift 750 pounds, squat 665, bench press 525 and clean and jerk 400 pounds.

But as far as Akim is concerned, King Ronnie gets the nod. "Ronnie was not only incredibly strong with those 800-pound deadlifts and squats and so many other lifts, but he won eight Mr. Olympia titles and more pro shows than any other man in the history of our sport," Akim said. Williams does give himself a little credit, though. "Ronnie did that 800-pound squat with a squat

TRAINING SPLIT

Monday:	Chest, shoulders and triceps*
Tuesday:	Back and biceps
Wednesday:	Legs
Thursday:	Chest, shoulders and triceps
Friday:	Back and biceps
Saturday:	Legs
Sunday:	OFF

**Up until 2014, Akim did no direct work for his shoulders, feeling they responded well enough from assisting on chest and back days. Only once he began competing as a pro did he realize that his delts needed to be rounder and more "capped," and he started working them.*



YOU WOULD BE HARD-PRESSED TO FIND ANOTHER HUMAN BEING TODAY WHO HAS THE COMBINATION OF FREAKY MUSCULAR DEVELOPMENT AND INHUMAN STRENGTH THAT AKIM WILLIAMS HAS.



suit, a belt and knee wraps, but I did 765 with none of those," he points out. "But I still bow down to Ronnie. He's the man!"

It should be clear by now that this point could be debated and argued ad infinitum. Is Akim Williams the strongest bodybuilder competing today? Maybe. Probably. Regardless, you would be hard-pressed to find another human being today who has the combination of freaky muscular development and inhuman strength that Akim Williams has. Not only is he a unique specimen in a sport that's already comprised of the genetic elite, but he has also defied standard and widely held beliefs about how to build extreme muscle mass. The really crazy thing is, he's only competed as a pro for two seasons, and has yet to show up with his condition truly dialed in. There is no doubt his best is yet to come, as he keeps on pushing tons of cold iron and working hard to improve. Freak power got him this far, and it will be his ticket to climbing higher up the pro ranks in the years to come.

Facebook: IFBB Pro Akim Williams
Instagram: IFBBProAkimWilliams

THE MUSCLEMEDS CONNECTION

A huge boost in Akim's bodybuilding career happened this past summer, when he became a MuscleMeds athlete. "The funny thing is, I had been using their Carnivor beef protein powder for a long time," he tells us. "I'm severely lactose intolerant, and even if I take Lactaid tablets, bad things happen if I have either casein or whey protein. Beef protein works perfectly for me," Akim explains. He also enjoys their Amino Decanate powder, sipping it during workouts, and snacks on their Carnivor soft-baked protein bars in the off-season. "I am so excited to be representing a company of the caliber of MuscleMeds, and with their support I believe I can get my first win in 2016!"

CLINICALLY TESTED MUSCLE BUILDING

BEEF PROTEIN

2 SCOOPS, 8 WEEKS

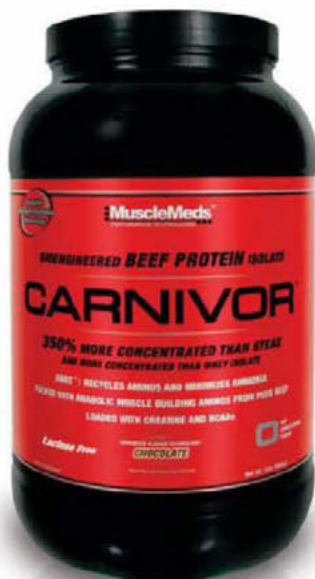
8 LBS. MUSCLE MASS*

The muscle building power of beef cannot be disputed. Ask most any bodybuilder and they will tell you that they make their biggest muscle gains and feel their strongest when they eat beef. Thanks to the development of CARNIVOR's advanced bioengineered Beef Protein Isolate (BPI), MuscleMeds has formulated a highly anabolic muscle building protein supplement that's shown in clinical research to build muscle mass and increase strength!

A new clinical study demonstrated that hard training athletes supplementing with CARNIVOR Beef Protein Isolate gained an average of 7.7 lbs. of muscle mass in just 8 weeks, while increasing strength. Researchers gave male test subjects 2 scoops of CARNIVOR BPI daily for 8 weeks while they exercised 5 days weekly. Athletes taking CARNIVOR BPI added an impressive 6.4% average increase in lean body mass. In contrast, the placebo group did not significantly improve their muscle mass from baseline.*

The study also showed that CARNIVOR BPI supplementation significantly increased lifting strength. Test subjects increased their average bench press strength by over 45 lbs. and added more than 90 lbs. to their deadlift over baseline.* These impressive clinical findings clearly validate the muscle and strength building power of CARNIVOR Beef Protein Isolate.

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Available in 10 delicious flavors!

EXPERIENCE THE POWER OF BEEF AT THE SPEED OF WHEY!

23g

PROTEIN

0g

FAT

0

CHOLESTEROL

0g

SUGAR

Everyone knows that beef builds muscle! Don't waste another workout—start fueling your body with a superior muscle building protein source. CARNIVOR is the world's first and #1 selling Beef Protein Isolate (BPI), delivering 23 grams of high quality pure beef protein in 10 delicious flavors. Thanks to advanced hydrolysis and isolation technologies, CARNIVOR is a USDA Inspected, 99% pure premium grade beef protein powder that's highly bioavailable and loaded with performance enhancing BCAAs and creatine. CARNIVOR'S exclusive BPI not only digests as fast as whey protein isolate, but is even more concentrated in muscle building amino acids. And with CARNIVOR, you get all the power of 100% beef with 0 fat, 0 cholesterol, 0 sugar, 0 lactose and 0 gluten. CARNIVOR is loaded with creatine, BCAAs and BCKAs for even more muscle building power. Don't be fooled by the other poorly formulated beef protein imitators. BEEF UP your muscles and get the results you want with CARNIVOR!

- CLINICALLY TESTED MUSCLE BUILDING PROTEIN
- HYDROLYZED FOR FAST ABSORPTION
- MORE CONCENTRATED THAN WHEY OR STEAK
- LOADED WITH CREATINE & BCAAs

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Available in Chocolate and Vanilla Caramel!

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HIGH SPEED MASS – ALL BEEF GAINER!

50g
PROTEIN

720*
CALORIES

0g
SUGAR

Welcome to a new era in mass building supplementation with CARNIVOR MASS, the fast, clean and highly anabolic lean mass gainer that provides your muscles with 50 grams of hydrolyzed Beef Protein Isolate (BPI) and 125 grams of high impact reactive carbs. CARNIVOR MASS combines a unique best-of-breed BPI with an exclusive iSpike™ technology to deliver a near-perfect insulin spike to support maximum muscle anabolism, glycogen replenishment and tissue regeneration to kick start your recovery, while helping minimize fat storage. With CARNIVOR MASS, you get the mass building support of beef at the speed of whey without the lactose, allergies and other problems that are frequently associated with the use of dairy products. And CARNIVOR MASS tastes amazing! If you're serious about making big muscle gains, start supplementing with CARNIVOR MASS and watch yourself pack on size right before your eyes!

- **50g HYDROLYZED BEEF PROTEIN ISOLATE**
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- **125g HIGH IMPACT REACTIVE CARBS**
- **LOADED WITH CREATINE & BCAAs**
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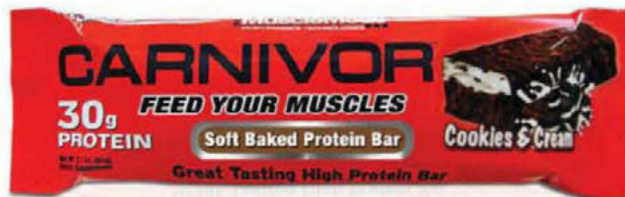
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SOFT BAKED PROTEIN BARS

30g
PROTEIN

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AMAZING
HOMEMADE TASTE



When you bite into a CARNIVOR Soft Baked Protein Bar, you'll instantly understand why so many people are raving that it's the best tasting bar they've ever tried. CARNIVOR BARS are made using proprietary baking technology to create a bakery fresh texture that's different than traditional protein bars. CARNIVOR BARS are a decadent, high protein bar that achieves an amazing candy bar taste while packing 30 grams of protein per serving.

These mouthwatering bars have a soft baked cake-like center surrounded by a rich chocolate coating, infused with either a gooey peanut butter or a flavorful cookies and cream filling. Support your active lifestyle and feed your muscles with CARNIVOR Soft Baked Protein Bars!

Available in Chocolate Peanut Butter and Cookies & Cream!

SOFT BAKED HIGH PROTEIN BROWNIE

15g
PROTEIN

190
CALORIES

CONVENIENT
AMAZING
HOMEMADE TASTE



Who says bodybuilders and athletes can't eat brownies? Satisfy all your cravings with MuscleMeds delicious Soft Baked CARNIVOR BROWNIES! These delicious high protein snacks have an amazing homemade taste while providing 15 grams of high quality protein with only 4 grams sugar and 190 calories. Pack in the protein you need with delicious Soft Baked CARNIVOR BROWNIES!

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*Based on Chocolate Fudge flavor. *Based on Vanilla Caramel flavor.

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PERFORMANCE TECHNOLOGIES



THE LEGEND OF

LOCKETT

BY DAN SOLOMON
PHOTOGRAPHY BY JASON BREEZE

**FROM THE RING TO THE
STAGE ... AND THE GAMBLE
THAT NEARLY RUINED HIM!**





"I know this may sound a bit crazy, but if I were to stop training for five years, I'd probably still beat a lot of bodybuilders."

Muhammad Ali once said, "It's the repetition of affirmations that leads to belief. And once that belief becomes a deep conviction, things begin to happen." Well, in the case of another former boxer, things are truly beginning to happen.

At just 13 years old, Michael Lockett was already a promising young star in the world of boxing. While most fighters are known to lead with their jab, only a rare few are equipped with enough raw power to use their jab to knock out their opponent. Lockett was one of those rare talents, a fiercely strong athlete who was way ahead of his time. By the time he was 21, the Cleveland native was a national Golden Gloves champion, with hopes of competing for Olympic gold. While he never reached the Olympics, it had become obvious to all who knew him that he was one of the most naturally gifted athletes anyone had ever encountered, a reality that was about to become even more evident when he decided to try a new sport.

THE TRANSITION

The story of Michael Lockett's entry into the world of bodybuilding reads like a work of fiction, a mind-boggling series of short stories, easily confused for urban legend. As a boxer, Lockett never touched any workout equipment. He was a well-defined, well-built 5'9, 196 pounds, a physique he managed to construct with an ambitious push-up, sit-up and sparring regimen. When he finally decided to train like a bodybuilder, his physique responded with an astounding 27 pounds of brand-new, well-proportioned muscle in less than 15 months. And he did it without the use of any supplements! (Yes, you read that correctly.)

Lockett recalls, "Before I started lifting weights, I had an eight-pack with huge calves. I also had pretty big arms and chest as a teenager. I was always muscular." He then goes on to share a story, reminding us that he is unlike anyone most of us have ever encountered. "I used to not like being so muscular when I was a child, because all the other kids made fun of me. The doctor told my mother that I was developing muscles at the age of three months. I know this may sound a bit crazy, but if I were to stop training for five years, I'd probably still beat a lot of bodybuilders."

Take a moment to process that. Michael was the little boy who got made fun of ... for being TOO MUSCULAR?!?!

THE GAMBLE THAT NEARLY ENDED HIS CAREER

With overall titles at the 2006 Team Universe and the 2007 Junior Nationals, a contest Lockett says he competed in WITHOUT any contest prep, his career appeared to be on the fast track. But in a surprising twist, the 24 year old disappeared from the bodybuilding scene, an absence that lasted a full six years, raising questions about the whereabouts of one of the sport's most promising young stars.

Lockett recalls the beginning of what turned out to be his darkest days. "When I was 25, I took a trip to Las Vegas to attend a friend's birthday party.

"I started hating myself. I was almost living in a homeless shelter. My life took a turn for the worse. I never thought in a million years that I'd be hooked on gambling."

After I checked into the hotel, I decided to gamble a bit. After I got done gambling, I went to party. Eventually I went to bed, but as soon as I woke up the next morning, I went to gamble again. I was hooked." Lockett continues, "I can recall gambling for 24 hours straight— from 8:00 a.m. until 8:00 a.m. the next morning. I didn't eat or drink anything. My mind was stuck on gambling. After I left the craps table, I was up 50K. I flew home and all I could think about was gambling. Later that same week, I flew back out to Vegas. It was a nightmare. I lost all the money that I had won, and all of my savings. I was in pure hell here on earth. I started hating myself. I was almost living in a homeless shelter. My life took a turn for the worse. I never thought in a million years that I'd be hooked on gambling."

In total, Lockett's gambling nightmare lasted five years. "It took prayer, faith and Gamblers Anonymous to help me get over my addiction. It's no joke. It's like being high on cocaine or being drunk off tequila. I experienced the highs and lows of gambling and I'll never go back to that again. I have used women just so I can gamble, and it still hurts me to this day. I've lost over \$200,000 gambling, but I thank God that I'm healed from that sickness. These casinos aren't built on winners. I was a true sucker for gambling, but that illness no longer resides in me."

A PHYSIQUE UNLIKE ANY OTHER

Once you get past the countless stories (and urban legends) that surround this unconventional star, we are left to examine the remarkably unique flair of his physique. The always-observant Bob Cicherillo offers up this analysis of Lockett: "When you see him in person, he carries really FREAKY muscle and a series of muscle insertions that are just mind-blowing. I almost get the impression he doesn't realize how good he really is— or just how great he could someday become." Cicherillo adds, "Once he truly figures out his physique, he will be very hard to beat."

The accolades don't stop there. MD Senior Editor Peter McGough, one of the most respected evaluators in the industry, explains, "Michael has an almost *unique* look to his muscularity. He has a muscle fiber composition of super deep, gnarly contours, chiseled in separation. There's a slight imbalance in his quads, and his back could be wider. He was second in two pro shows in his rookie season, but I think it's only a matter of time before he hits 100 percent and wins an IFBB pro contest."

BACK ON THE SCENE!

After his six-year break, poised to reestablish himself, Lockett returned to competition and scored runner-up finishes at the 2013 North Americans and the 2014 NPC Nationals, marking the end of his amateur career. His long-awaited pro debut came in 2015 with the unveiling of an improved physique. According to Cicherillo, "In his first



LOCKETT JOINS MUSCLEMEDS!

"A week after I competed in Texas, I joined Team MuscleMeds! I chose them because they're a great company, true professionals. I've always loved their products, especially Carnivor Mass ... it's a highly anabolic, all beef, mass-building, beef protein isolate!"



"To say he has a unique look would be an understatement. He reminds me of what Bertil Fox would look like in the modern bodybuilding world." –Bob Cicherillo

season as an IFBB pro, Michael established himself as a legitimate contender. To say he has a unique look would be an understatement. He reminds me of what Bertil Fox would look like in the modern bodybuilding world."

He competed four times as a rookie, landing in the top five each time, including a runner-up finish at the Chicago Pro. The recipient of a new endorsement deal with MuscleMeds Performance Technologies, Lockett recalls, "The most memorable moment of my rookie year was at the Chicago Pro, when the judges had called me and John De La Rosa back to the stage for a head-to-head comparison. I'll never forget that moment. I live for those moments. It will always be with me. And after the emcee announced me in second place I was a bit hurt, but I gave John the utmost respect." He adds with a smile, "I told John that if this ever happens again, we'll have to settle it in the street."

Lockett's remark to De La Rosa is a not-so-subtle reminder that beneath all of that new muscle, lies a man who spent his younger years knocking out opponents with a rare combination of strategy and power, the same formula that may someday elevate him to the top of the bodybuilding world.



RAPID-FIRE Q&A

With Michael Lockett

After you won the 2006 Team Universe, word traveled quickly that you won the show without the use of ANY supplements, of any kind. Is that just an urban legend?

That is exactly correct. I won the 2006 Team universe without using any supplements of any kind. People on the MD boards and other forums couldn't believe that I was all natural.

Now that you've reached the pro ranks, have you been forced to change the way you prepare for competition?

Definitely. I no longer eat two or three times a day (he laughs). I now eat seven or eight times a day. I take in around 6,000 calories a day. My body responds very well to carbs. But since my girlfriend loves cooking, it makes my job a lot easier.

Choose one— an Olympic gold medal in boxing or a Mr. Olympia title?

I would definitely choose being Mr. Olympia over an Olympic gold medal in boxing. Even though my first love is boxing, winning a Sandow is priceless.

What's the plan for 2016?

My plan is to bring a better package to the stage. I need to develop certain body parts to be more competitive in this sport. I had a great rookie season, but I'm looking to have a sensational season in 2016!

What's been your biggest disappointment as a bodybuilder?

My biggest disappointment was not competing during those years that I wasn't present. If life had a reset button, I'll surely hit it now.

Hardest personal obstacle you've been forced to overcome?

Gambling! I never thought I'd get hooked on gambling. It took me years to realize it, but through the blood and mercy of Jesus, I overcame that stronghold. (Editor's note: If you struggle with gambling addiction, visit gamblersanonymous.org)



WHAT SOME EXPERTS ARE SAYING ABOUT MICHAEL LOCKETT

Ron Harris, MD Senior Writer

"I was impressed with what Michael brought to the stage in his rookie season. Lockett has a unique look, a combination of round fullness plus a grainy density to his muscles. His shape is excellent, and he has no weak body parts. I could see him moving up the ranks soon. My only concern with Lockett is what appears to be a withered right quad, which I find quite distracting on an otherwise excellent physique. I'm not sure if it's the result of a tear, nerve damage or something else, but it is a liability. Aside from that, I find Michael Lockett to be an exciting and refreshing new addition to the IFBB stage, and look forward to seeing him up against some higher-caliber competitors in 2016."

Chad Nicholls, Bodybuilding Guru

"When you see him in person, he carries really FREAKY muscle and some muscle insertions that are just mind-blowing. I almost get the impression he doesn't realize just how good he is— or just how great he could be. I believe that once he figures out his physique, he will climb the ladder fast. We saw a glimpse in Chicago, but you can tell he's still a work in progress."

BY PETER MCGOUGH
PHOTOGRAPHY BY GARY PHILLIPS





Diary of **A DREAM FULFILLED**

The Long Road to Pro for 2015 NPC Nationals Overall Champ, Sergio Oliva – One of the Most Famous Names in Bodybuilding

PROLOGUE

DATELINE: APRIL 1962 – MIAMI, FLORIDA

Twenty-two-year-old Sergio Oliva, while representing Cuba as a weightlifter at the Central American and Caribbean Games in Kingston, Jamaica, defected from his home country and arrived in Miami, Florida, to fulfill a dream. A year later, he moved to Chicago and a new life as a pro bodybuilder beckoned.

DATELINE: NOVEMBER 4, 1984 – NEW YORK

In a much-heralded comeback after 12 years away from IFBB competition, Sergio Oliva entered the 1984 Mr. Olympia being held at the Felt Forum in Madison Square Garden, New York. The three-time Mr. Olympia's (1967-'69) participation was the biggest storyline of the event. In the end he finished eighth, which was devastating for him and his fans. The crowd was in uproar and as he processed that eighth place, a frown swept across his face. He started to amble toward the front of the stage, asking for the microphone. Given the political fireworks that Sergio and the IFBB had been involved in 12 years earlier, many were convinced he was going to go ballistic, something not alien to his hot-blooded temperament.

Sensing the potential for ugliness, legendary bodybuilding journalist Rick Wayne (who nicknamed Sergio *The Myth*) leapt from his front-row seat and moved toward Sergio's wife, Arleen, who was holding 2-week-old Sergio Jr. Wayne picked the infant up and handed him onstage to Sergio Sr. The 43-year-old former Mr. Olympia cradled his son in his arms and declared to an expectant audience, "No matter what happened tonight, eighth, 17th or 20th, I'll forever be The Myth. And I hold in my arms Sergio Jr., the next Myth."



Everyone breathed a sigh of relief and basked in the glow of a father's love for his son. A new life was only two weeks old, but a declaration of intent had been made on his behalf. In the years to come, that declaration was to have severe emotional repercussions and would cause anguish and friction between the two Sergios until the end of the elder's life.

DATELINE: JULY 24, 1986 – CHICAGO

On that day, Sergio and wife Arleen were embroiled in an argument in their Chicago home. By that time, Sergio was a 20-year veteran of the Chicago Police Department and during the argument Arleen, in self-defense, grabbed her husband's service revolver and shot him in the abdomen. Such was the density of muscle in the three-time Mr. Olympia's midsection that he didn't actually feel the gunshot, and Arleen had to point out that he was bleeding. She then drove him to the hospital and no charges were filed.

DATELINE: SEPTEMBER 21, 1996 – CHICAGO

With the Mr. Olympia contest being staged in Chicago, Sergio Sr. (as a past Mr. Olympia and Chicago policeman) was a guest of honor at the event and he took his son with him. The Myth was besieged by requests for autographs and photographs. This was when 11-year-old Sergio Jr. fully realized how iconic a star his father was in the bodybuilding firmament. He also realized how much his father loved being recognized as Mr. Olympia, loved the attention and liked to play to the gallery.

DATELINE: JANUARY 2003 – CHICAGO

At 18 years of age, Sergio Jr. was 6 feet tall, weighed 140 pounds and ran track, finishing second in the hurdles at the state championships. Not liking his sparse build, he began to think of training with weights.

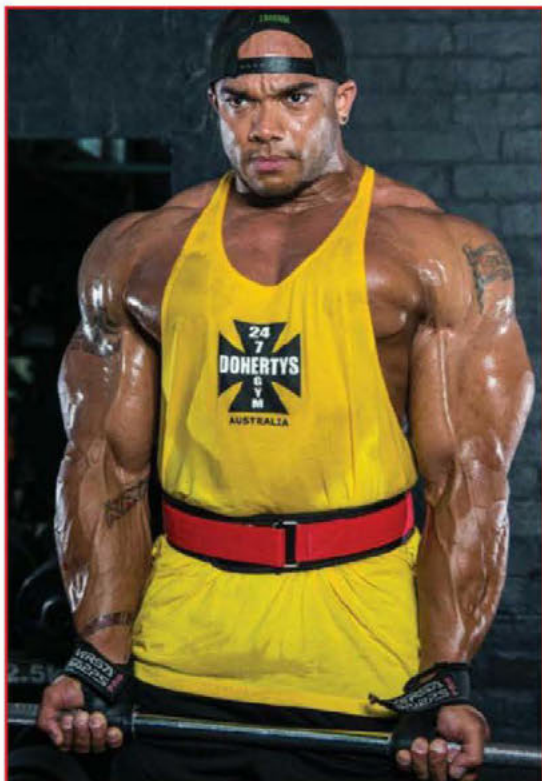
Despite Sergio Jr. being anointed by his father in 1984 as the “Next Myth,” the elder Sergio did not want his son to follow in his flexing footsteps. He was more concerned that his offspring studied, went to school, became a doctor or a scientist, and would have a different future than he himself had. Sergio Jr. explains, “He was born in poverty in Cuba, only

made it to third grade. Before becoming a policeman, he worked 12-hour shifts in a steel mill and he said he didn’t want bodybuilding to distract me from my studies.”

In fact, Sergio Sr. went to great pains to sabotage his son’s bodybuilding exploits. He spoke to the gym owner where Sergio Jr. was training, and got him to bar the 18-year-old from training there. Undeterred, the youngster found another gym to train in. But such is the radar of a Chicago policeman that Sergio Sr. duly called that gym owner, and the would-be bodybuilder was banned from there. In a move that both highlighted the division between son and father, while also illustrating the son’s desire to bodybuild, Sergio Jr. and fiancée Halley left Chicago and went to live and train in Destin, Florida, where his mother lived.

DATELINE: OCTOBER 23, 2004 – PANAMA CITY, FLORIDA

Sergio Jr. entered his first contest, the 2004 Southern USA in Panama City, as a 176-pound middleweight and finished second. He remembers, “I was so nervous before I went onstage. I was saying to myself, how stupid are you to drive across the country to pursue your dream? What are you thinking? Then I went out there and everything changed. It was like I belonged up there, hitting poses and hearing the reactions of the crowd—it was a great feeling. I knew this is what I want to do. More than that, what drove me on, even at that early stage, was that I wanted to be a pro. At two weeks, I’m the youngest to ever appear on an Olympia stage and I wanted to return as a fully-fledged competitor. That thought inspired me for the last 11 years.”



“OF COURSE MY FATHER HAD GREAT GENETICS, AS HAS PHIL HEATH, BUT THEY STILL HAD TO WORK THEIR ASSES OFF TO BE ABLE TO EXPLOIT THOSE GENETICS AND DELIVER THE FINAL PRODUCT. I REALIZED MY GENETICS DIDN’T MEAN SHIT IF I KEPT RUNNING TRACK.”





Mother Arleen, who attends all his contests, recalls, "After he came offstage he said, 'Mom, I knew I wanted to do this, but until now I didn't realize I was meant to do it.' I knew then that bodybuilding would be his life."

Of course, having the name Sergio Oliva immediately sparked the interest of any bodybuilding fan worth his supercharged protein shake. From the get-go, the mere mention of his name invited comparisons with his legendary father. Sergio Jr. remains pragmatic about the situation: "I mean, there I was ... a 176 middleweight, and pictures of me on the Internet were posted, comparing me with my father, who many consider the greatest bodybuilder who ever lived. Who else has had to go through that sort of comparison? But I'm not bitching about it. I understand if Arnold Schwarzenegger's son took up contest bodybuilding, the same focus would be on him."

"Then there is the assumption of some that this bodybuilding thing is easier for me because I have my father's genetics. Of course my father had great genetics, as has Phil Heath, but they still had to work their asses off to be able to exploit those genetics and deliver the final product. I realized my genetics didn't mean shit if I kept running track. That whatever physical talent I inherited from my father would be better suited to bodybuilding. Nobody's going to give me a freebie Olympia title because of my name. Whatever success I have will be down to how hard I am willing to work, how hard I'm going to push myself. My success will be down to what I do and that really attracts me to bodybuilding."

DATELINE: JULY 25, 2015 – LAS VEGAS

The 2015 USA Championships staged in Las Vegas was the big one for Sergio. Eleven years after his contest debut, this

was his first attempt at taking home a pro card. And he would have won that superheavyweight class if longtime competitor Blair Mone had not been in the shape of his life, and incidentally gained a pro card at his 11th attempt. Finishing second left Sergio pretty devastated: "I'm not going to say I had a breakdown, but in my hotel shower afterward I just began crying—I've never done that before."

The next statement will give you an insight into the generous nature that embodies Sergio Oliva Jr.: "When Blair was announced first I told him, your perseverance defines what it means to win a pro card—you deserve it." He adds, "Blair's was a hell of an achievement. I don't think I could survive 11 attempts."

Sergio was impressive in gaining that runner-up spot, although the main knocks against him were he needed to be better conditioned in the back,

glutes and hams. In fact, he never said anything at the time, but the truth is he damaged his left hamstring a year before the USA and was only able to train them—and painfully at that—during the eight weeks prior to the contest. He says ruefully, “It’s kind of tough to lose a contest and be told that one of the main reasons was because of a body part you could not train.”

From July’s USAs, he set his sights on the NPC Nationals scheduled for November 20th and 21st in Miami. He was driven by the vision of, “My whole philosophy of bodybuilding is crystallized by the knowledge that after each show you have a job to do. That you better be working on the weak aspects that let you down in your last show so that you show improvement next time out. Instead of that task being a chore, it really excites me that it is possible by working to a concerted plan you can, over weeks, months or years, change your body, improve it and make it more competitive. That, to me, is the essence of bodybuilding, and I love it. So I relished the challenge to put right what was wrong. The bonus was my hamstring healed up, and I was able to train full bore with no pain.”

**DATELINE: SUNDAY, NOVEMBER 15, 2015
(FIVE DAYS BEFORE THE NPC NATIONALS) – CHICAGO**

I interviewed Sergio on this day and he told me, “I don’t want to get carried away with myself, but the Nationals is the first contest where I feel it’s my show to lose. Now some sort of unknown freak may come out of the woodwork, but I feel like if I nail my conditioning and don’t mess up, this is my best chance to take the pro card. At the USAs I was 255 pounds; I’ll be around 248 at the Nationals and much sharper. For the first time I’m not going to the show saying well, we’ll see how it goes. More than that, I feel that if I don’t win it will be failure, and I’ve never felt like a failure before. I really have no excuse if I don’t win.”

We also spoke of his father, who passed on November 12, 2012, and how he never came around to supporting his son’s bodybuilding endeavors. Sergio harbors no bitterness, but it’s clear he still feels deprived that his legend of a father did not approve of him taking up the same sport. He couldn’t help but opine on the paradox of the situation as he said with a wry smile:

“My father presented me to that Madison Square Garden crowd when I was 2 weeks old, saying I would be the next Myth. And then 18 years later, when I said I wanted to do what he did and deliver on his promise, he did everything possible to derail my ambitions. I’m sponsored by Lee Labrada, who is a positive mentor to me, and I see how he interacts with his son Hunter, who is bodybuilding, and then I think of Darrem Charles and his son, who actually do guest-posing together, and I can’t help but wish I’d had that sort of relationship with my father ... ah, well. I’ve been in the gym with my mom more than my dad, and every time it was with my dad it was for a photo shoot, and he wasn’t keen on doing that.





"To get into the sport knowing that I'll always be compared to one of the greatest bodybuilders ever proves that I'm either really nuts or really ballsy. I guess we'll find out which one it is next week. Anyway, I'm getting ready to fly to Miami in a couple of days and I can confidently say, yes I have my dad's genetics, but in personality I am my mother's son, and it's my hard work that has put me in the place I am now."

DATELINE: THURSDAY, NOVEMBER 19, 2015 – HYATT REGENCY HOTEL (24 HOURS BEFORE PREJUDGING OF 2015 NATIONALS)

Looking toward the next day, Sergio told me, "I'm excited that we're nearly there. Don't want to sound too monumental, but it's like the past 11 years are climaxing at this contest— that it could decide my future and it's all riding on a couple of minutes spent, hopefully, in the first comparison. I've never felt like this before, and you still have all these thoughts: could I be better? Could I have done with more time? The main thing is I don't want to let anybody down, including myself."

DATELINE: FRIDAY, NOVEMBER 20, 2015 – JAMES L. KNIGHT CENTER, MIAMI

The prejudging of the superheavyweight division was a hectic affair. By the battery of callouts, Sergio seemed to be in pole position, was but closely followed by



"YES I HAVE MY DAD'S GENETICS, BUT IN PERSONALITY I AM MY MOTHER'S SON, AND IT'S MY HARD WORK THAT HAS PUT ME IN THE PLACE I AM NOW."

the impressive duo of Eddie Bracamontes and Jonathan Irizarry. To my eyes, Sergio, with his fully rounded musculature, size and conditioning, was the winner. I asked for his thoughts on being in the first callout: "The most wonderful feeling imaginable. I was really revved-up to go out there and hit my shots. I want this so bad. All I know is that if somebody beats me, they'll have worked as hard as I did for it. And if they did, then they would fully deserve to win. Can I improve for tomorrow night's finals? Maybe I can be a bit drier ... a bit harder. I may already be destined for a pro card, but right now maybe that's not good enough. I want to win the division and go for the overall. I want a storybook ending to my journey. Now I just have to get through the wait to the finals. It will be the longest day of my life."

DATELINE: NOVEMBER 21, 2015 – JAMES L. KNIGHT CENTER, MIAMI

On this Saturday, Sergio Oliva Jr., vociferously supported by his mom Arleen and a couple of dozen supporters wearing T-shirts emblazoned with the logo "History In The Making," stormed to victory by winning the super heavyweight class and then the overall at the 2015 NPC Nationals. Backstage, he fell into his mom's arms and then he and fiancée Halley sobbed on each other's shoulders. A dream had been realized and a storybook ending had been played out.

I asked him if the last 24 hours had indeed been the longest day of his life: "If it's the longest, it has to be the greatest, yeah? At this point I'm thinking this has been a great day, but you know it's been a great life. Going into tonight, I just wanted to get on there, get it over with. It was a case of let's see how the dust settles— am I good enough, am I as good as I think I am? Throughout these two days, I had anxiety and stress. I always have that, but what was different was that in all previous contests, I was scared. This is the first time, although I'm stressed, I'm not scared. Previously, I'd be backstage and see all those guys and think ... Oh, they're so big, what am I doing here? This time, I felt like I belonged. Throughout, I focused on that pro card, that little piece of paper that means so much."

I asked him to encapsulate his thoughts on the end of his amateur journey: "Winning my pro card means every decision I've made in the last 12 years was right, and led me to this moment. Every setback taught me a lesson. You have to love it and want it so much. I sort of gave up the life of a normal 20-something: no partying or clubbing, all the rest of it. And you wonder at times is this going to be worth it? It's such a gamble and then here I am at 31 thinking, you know, at this age you should be a pro or about to become a pro. It's important for me to be a good pro— not just be there to make up the numbers. I have that Oliva blood in me, and that dictates there's no way I'm going to



"I HAVE THAT OLIVA BLOOD IN ME, AND THAT DICTATES THERE'S NO WAY I'M GOING TO DO SOMETHING AND NOT WANT TO BE THE BEST AT IT."



Sergio Oliva holding Sergio Jr. at the 1984 Olympia when he was two weeks old.

Bottom: Peter McGough interviewing Sergio at the 2015 Nationals where he was overall winner.

do something and not want to be the best at it. You know, maybe 12 of the guys I competed with at the 2012 Nationals are pros. So prior to the 2015 Nationals, my thought was, why am I not a pro? You see many guys trying to be a pro and for many of them, you know ... 'You're never going to make it, kid.' They give up jobs, divorce wives, use all their money and still they don't get a card. They've put their whole life into it and negatively affected other people's lives, and still they don't make it. Am I going to be one of those guys?

"And before you ask, I want to enjoy this moment, consider my plans, before I think what the first step in my pro career will be. For now, I have the thought that my first NPC contest was in Florida and my last NPC show was in Florida. That's a couple of nice bookends to an 11-year odyssey."

And as always with someone named

Sergio Oliva, at this moment of victory, it is inevitable that the man whose signature was the victory pose (which his son executes in style) still hung over the proceedings. The new pro reflects, "If my dad was here today, he wouldn't be making the noise my mom and other family members are making. And as hard as he'd been on me, I like to think that if he were here today, he would recognize I do have a future in this sport, and like to think that he would have hopped onboard to support me ... but I'll never know."

EPILOGUE

DATELINE: NOVEMBER 2015 – MIAMI, FLORIDA

Thirty-one-year-old Sergio Oliva Jr. arrived in Miami, Florida, on November 17th to fulfill a dream. A few days later he left Miami, returned to Chicago and a new life as a pro bodybuilder beckoned. There's certain symmetry that for both Sergios entwined by blood, by their chosen profession and by a complicated relationship, Miami was the gateway to a new life. Like father, like son indeed.

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A NEW THUNDER FROM DOWN UNDER!

Rookie Josh Lenartowicz Is the Best Pro From Australia

JOSH WHO?

I do a pretty good job of keeping up with the pro bodybuilding scene, as I bet many of you do too. It's a rarity that someone I've never heard of wins a pro show, but that's exactly what happened when I saw that someone named Josh Lenartowicz had won the San Marino Pro in Italy, nearly two months after the 2015 Mr. Olympia. At first I assumed he was Polish, given his surname. It turns out he's from Australia. It's been a while since we had any good pros hailing from Down Under. There was the late Sonny Schmidt, who was a consistent top-five man throughout the '90s. He competed in nearly 50 IFBB contests, with his only win being the 1995 Masters Mr. Olympia. And of course, there's Lee Priest, who many feel is the greatest short bodybuilder of all time, as well as MD's pick last year as having the best arms our sport has ever known. Now we have 32-year-old Joshua Lenartowicz, who weighs a hulking 315 at 5'10" and shreds down to 260 pounds for the stage, with monstrously full deltoids and truly enormous, sweeping quads. Steve Blechman charged me with the task of finding out more about this new sensation, and in fact I spoke with him in his hotel room in Palm Desert, California just hours before he went on to score his second IFBB win in 2015 at the Ferrigno Legacy contest.

HUMBLE BEGINNINGS

Joshua grew up in Sale, Victoria, a country town of just 12,000 people. The youngest of three boys, his first athletic pursuits were basketball and swimming. The men of the house also loved to arm-wrestle each other, and perhaps as a portent to the future, young Joshua was able to beat them all by the time he hit puberty. His older brother Adam was the first of the family to show an interest in bodybuilding, taking a job working the front desk at a local gym. When Josh was only 12, it was a poster of the 1995 Mr. Olympia posedown on his brother's wall that sparked what

BY RON HARRIS
PHOTOGRAPHY BY GARY PHILLIPS



would become his passion in life. "I had never realized human beings could look like those guys: Dorian, Kevin Levrone, Shawn Ray, Nasser and Flex," he recalls. "It was a photo of Dorian Yates in his front lat spread that impressed me the most and absolutely made me want to become a bodybuilder," he says.

He got a VHS copy of "Pumping Iron" and watched it dozens of times, and provided himself a proper basic education by means of three books he read over and over: *Arnold's Encyclopedia of Bodybuilding*, *Strength Training Anatomy* by Frederic Delavier and *Power Eating* by Susan Kleiner. Unfortunately, his father felt 12 was too young to be lifting weights, and didn't lift that ban until Josh was 14. "That's when I was old enough to work, and he said if I got a job I could start training too," he explains. In his unbound enthusiasm, Josh would wake up at 5:30 a.m. every morning and ride his bike to the gym to train before school. "It was a little gym and we were out in the country," he says. "One day, I was doing a set on the bench press and a ram wandered inside." Humble beginnings to be sure, but Lenartowicz was well on his way.

THE JOURNEY TO IFBB PRO

Throughout his early to mid-20s, Josh was one of the best bodybuilders in an international natural federation called the INBA, working his way up from the city, regional and national level, all the way to their biggest event, which so happens to bear the Mr. Olympia title (don't ask me; that's one for the lawyers to argue). Josh had every intention of remaining with this federation until he finally reached that pinnacle. "I was pretty disheartened, because I'd given everything to do it; a lot of sacrifices and a lot of suffering," he recalls. "But the auditorium was half empty, and there was hardly any publicity at all for us."

Realizing he had taken the route in the INBA as far as he could, Lenartowicz decided it was time to set his sights on a loftier goal, to be an IFBB

pro. Knowing he was nowhere near big enough yet for that level, he took a full seven years off from competing to gain the needed mass. In 2013, he set a goal of becoming Australia's best bodybuilder in two to five years, and to be on the Mr. Olympia stage within five to 10 years. In 2014, he entered the FitX Amateur Grand Prix/Pro Qualifier, held in conjunction with that expo and the pro show in Melbourne, promoted by Tony Doherty. Josh won that, which qualified him to compete in the IFBB Australia Pro just hours later.

"I hadn't even counted on winning the qualifier, but once I did, it seemed crazy to pass up doing the pro show that day, too." He finished a very respectable eighth place out of 13. Shawn Rhoden won, with William Bonac in second, Evan Centopani in third, Branch Warren fourth and Ed Nunn wrapping up the top five. "I was tremendously motivated from that experience, as you might imagine," says Josh.

In 2015, he started his season off at that same event, which had now become the Arnold Classic Australia. In a much tougher lineup that featured most of the Arnold Classic competitors from the weekend before in Ohio, he placed ninth. But his two final contests of the year were back-to-



back wins at the San Marino Pro and the Ferrigno Legacy. "Now I'm qualified for the 2016 Mr. Olympia, something I gave myself up to 10 years to accomplish," he laughs. "I'm very happy to be so far ahead of schedule."

A LIFE-CHANGING LEG WORKOUT WITH RONNIE COLEMAN

One of Josh's most memorable experiences as a bodybuilder happened in 2014, when eight-time Mr. Olympia Ronnie Coleman was in Australia to promote his supplement brand. "Nick, the owner of my gym, said that Ronnie was coming down and we might get to train with him, but we'll see." Excited but not wanting to get his hopes up, Josh continued on his normal workout schedule. On a day he had already trained back in the morning and then came back later in the afternoon to hit biceps, he got the word that Ronnie wanted to train legs at his gym later that night, and he was invited. Even though he'd already worked out twice that day, "there was just no way I was going to pass that up," Lenartowicz says.

The workout was a milestone for Joshua, and not only because it was a dream come true to train with a living legend of our sport. Prior to this, his best squat had been 240 kilos, or 528 pounds. "But with someone like Ronnie Coleman yelling in your ear to lift more weight, you find you are capable of




CONTEST HISTORY

2004 INBA Mr. Melbourne
2005 INBA Mr. Victoria
2005 INBA Mr. Australia
2006 INBA Mr. Victoria
2006 INBA Mr. Australia
2006 INBA Mr. Olympia
2013 IFBB Australasia
2014 IFBB FitX Pro Qualifier
2014 IFBB Australian Grand Prix
2015 IFBB Arnold Classic Australia
2015 IFBB San Marino Pro
2015 IFBB Ferrigno Legacy

Junior and Overall Champion
Junior Champion
Junior Champion
Men's Overall Champion
Second, Men's Medium
Second, Men's Medium-Tall
Super Heavyweight Winner
Overall Champion
Eighth Place
Ninth Place
Winner
Winner

"WORDS DETERMINE YOUR WORLD. IN THE GYM, LET'S SAY, IF YOU THINK A WEIGHT CAN CONQUER YOU, IT WILL. OR YOU CAN BELIEVE THAT THE WEIGHT WILL ALWAYS BE THAT WEIGHT, BUT YOU ARE GETTING STRONGER EVERY DAY, AND THEN YOU CAN CONQUER THAT WEIGHT."



TRAINING SPLIT

Day 1: Back
Day 2: Chest
Day 3: Hamstrings and calves
Day 4: Shoulders and traps
Day 5: Arms
Day 6: Quads and calves
Day 7: OFF

**32-YEAR-
OLD JOSHUA
LENARTOWICZ
WEIGHS A
HULKING 315
AT 5'10" AND
SHREDS DOWN
TO 260 POUNDS
FOR THE
STAGE, WITH
MONSTROUSLY
FULL DELTOIDS
AND TRULY
ENORMOUS,
SWEEPING
QUADS.**



**"BEING RANKED AUSTRALIA'S
NUMBER-ONE BODYBUILDER
BEGAN A ROARING BLAZE. I'M
JUST GETTING STARTED."**

more than you ever thought." In that workout, he did three reps with 300 kilos, or 600 pounds, which you can find on YouTube under the title "7platesJosh."

"That empowered me for a whole year," Josh reports. "Any time I felt tired, I thought, hey, I did back and biceps one day and still made a 60-kilo jump in my squats, training legs that same night. Just because someone says you can only train one muscle group a day, or you only have a set amount of energy to give, doesn't necessarily mean it's true. If you let other people's opinions and beliefs influence your beliefs and decisions, you're gonna end up living someone else's life. Limitations are just like fears—they're an illusion."

"WORDS DETERMINE YOUR WORLD"

Certainly, Josh's exceptional genetics have played a major role in his rapid rise in the sport. But an equally important component has been his attitude and outlook. "I'm a big believer that words determine your world," he begins. "In the gym, let's say, if you think a weight can conquer you, it will. Or you can believe that the weight will always be that weight, but you are getting stronger every day, and then you can conquer that weight."

Bodybuilding is about much more than the exterior physique we see. Josh sees it as a way to master your own destiny by perfecting your physical body. "From an early age, I saw people working for a pension, not a passion," he says. "I thought to myself, you can get in and out of your house, or your car, but you're always inside your own body. Why not look after it the best you can and make that a priority?"

A TOP-NOTCH TEAM BEHIND HIM

Josh is quick to give credit to those who have helped him along the way. First and foremost is his wife, Lizzie, whose love and support has kept him going even when he had his moments of doubt. Her father, Sanitesi Latu, who was Australia's decathlon champion in 1974 and 1978, provided tremendous moral support. Not every father-in-law would encourage his daughter's husband to pursue his dreams of being one of the world's best bodybuilders, but he told Josh to "give it everything you have, so you can look back later on with no regrets."

Lenartowicz was coached by Chad Nicholls for his first couple of pro shows, and is now working with IFBB great Chris Cormier. "The kid has a huge heart," Cormier says. "I put him through hell with posing practice to improve his presentation, and he never backed down or complained once."

Josh also thanks top Australian promoter and gym owner Tony Doherty for all his help and encouragement, as well as New Zealand's Moe Moussawi.

Josh Lenartowicz knows he is a work in progress, but he's proud to represent his native Australia and eager to work his way up the competitive ladder. As Josh put it: "Images of past champions were the spark, my friends and family fanned the spark into a flame, competing in bodybuilding contests is what turned the flame into a fire, and being ranked Australia's number-one bodybuilder began a roaring blaze. I'm just getting started."

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PAIGE HATHAWAY

She Wants to Inspire You

The last few years have seen the career of Paige Hathaway skyrocket, with the small-town girl from Minnesota transforming herself into a fitness entrepreneur, cover model, Bikini competitor and SHREDZ-sponsored athlete with over 3 million Instagram followers. Paige finds great satisfaction in empowering others and helping them to achieve their fitness goals—allowing millions to *turn a paige* and transform their lives.

A full-page photograph of a woman with long, wavy blonde hair, wearing a red string bikini. She is sitting on a sandy beach, leaning back on her hands, and looking over her shoulder towards the camera. The background shows the ocean and a bright sky.

“What I have found most fulfilling is helping other people achieve their fitness goals. There is nothing more rewarding than sharing your own story and being told it helped empower someone else to achieve his or her goals.”



THE BEST ANABOLIC STEROIDS FOR BOOSTING MUSCLE, POWER, STRENGTH AND HYPERTROPHY

These are the least-favored types of articles to write, yet the most popular with readers. The paradox being that discussing the misuse/abuse of anabolic-androgenic steroids (AAS) suggests AAS are the sole determining factor for the achievements of bodybuilders and athletes; legitimizes illicit and undirected use by vulnerable and ignorant adolescents and young adults; exposes readers to temptations and choices; and promotes the illicit distribution of AAS, profiting unscrupulous individuals, which hampers the acceptance of expanded indications for prescribed and monitored use. Yet, readers seek the physical rewards attainable only when AAS augment resistance training's effects as well as the support of a suitable diet and lifestyle. The rewards to many from AAS are not merely physical or "physique," but can also enhance social standing, financial gain, job opportunity/security, self-esteem and ironically, health, when used in a conscientious manner.

There are three responses that are most commonly sought after by young, recreational AAS misusers: power, strength and size. These are by no means exclusive, and most seek a component of all three. Power and strength are often used synonymously, but there is a difference. Power is a metric that is most relevant to athletic performance, referring to the amount of force a muscle can produce per unit of time. The standing high jump is a commonly used measure of power. Strength is the amount of force that can be exerted in a single effort. This is best represented by the one-rep maximum (IRM) lift in the bench press, squat and deadlift.

MEASURING POWER AND STRENGTH

Both power and strength can be measured in absolute terms or relative terms. For example, a 242-pound powerlifter benching 500 pounds is stronger than a 181-pound

lifter benching 405 pounds. However, the 181-pound lifter has greater relative strength, as his max is a greater multiple of his bodyweight— $405/181 = 2.24$ versus $500/242 = 2.07$. Similarly, many athletes are capable of generating greater power, despite being relatively weaker (i.e., less strong) than their powerlifting counterparts. It makes the use of the term powerlifter somewhat confusing, doesn't it? Take the example of a shot-putter. He may be able to throw a shot 60 feet or greater, whereas a powerlifter whose strength is much greater may not reach half that distance. This demonstrates that power is an expression of the combination of a learned skill set combined with the balanced and coordinated actions of numerous muscle groups, as well as the rate at which the force can be generated. Strength is a more raw,

gross motor skill, performed to demonstrate the maximal force that can be generated by large muscle groups in a controlled lift.

Size is perhaps more applicable to bodybuilders, and most recreational lifters, as they are not measured in competitions of strength or performance, rather presentation. Granted, it is a presentation that demonstrates a regimen of disciplined diet and training in a goal-directed manner, but the events themselves are scored as pageantry. The general public, while espousing the goals of becoming healthier or improving one's physical function, is typically motivated by image and social response to a greater degree. Size can be measured in a number of ways: bodyweight; arm/chest/thigh circumference; clothing size; site-specific measures that incorporate





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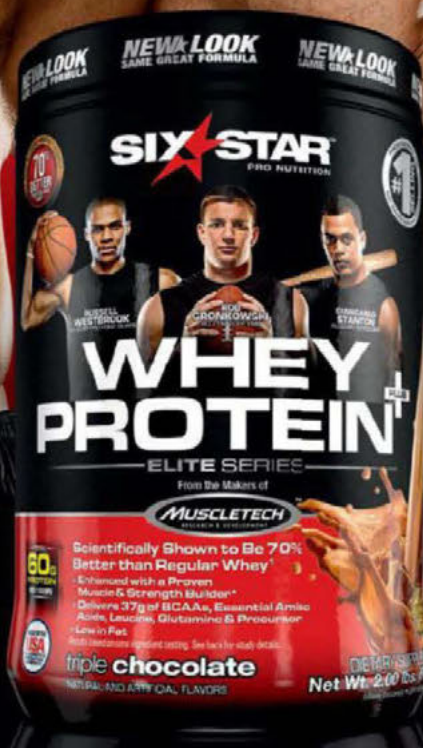


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symmetry as a target; and even highly technical measures of muscle volume. In considering size, bodybuilders also take into consideration the composition of the increase (i.e., lean, hard mass versus general or even “doughy” gains).

COMBINING SEVERAL AGENTS

Most articles of this type will focus on single AAS that might seemingly provide power, strength or size exclusively. In fact, this is not the practical experience of the AAS-using community. Certainly, most neophytes or the timidly cautious will see quickly realized gains from a single agent cycle, as will be briefly discussed. However, once a person has developed a substantial base muscle mass and has prior exposure to AAS, the “optimal” response typically requires a combination of several agents. There is a saying that “no cycle is as satisfying as your first one.”

So, prior to discussing single types or examples of AAS that may be more appropriate for improving power, strength or size, it is important to consider what the decades-long experience base of AAS users has determined as the foundation for drug-induced gains.

It is useless to discuss the AAS-induced gains if the training and diet, as well as lifestyle, are not emphasized, first and foremost. AAS aid in increasing the training response and tolerating the stress of training and diet. Thus, any AAS-related success is predicated upon adequate training and diet—consider those two factors first so that the health, legal and social risks associated with AAS use do not fail to result in the anticipated benefits due to poor planning or execution.

For neophytes taking a single AAS, there are definitely differences between the various AAS that can preferentially promote power, strength or size. However, for the neophyte, the primary factors involved in the decision are access and ease of use. Hence, the popularity of oral AAS—specifically, the well-known dianabol, Winstrol and even Anadrol-50.

EAST GERMAN DOPING REGIMENS

Consider what the doping regimens were in the 1960s through 1980s, revealed when East German (aka German Democratic Republic) documents uncovered the state-sponsored doping program.¹ Their athletes, beginning at an age of perhaps as young as 10, maybe even younger, were doped with oral AAS to provide a rapid response and rapid clearance, as well as certain injectable AAS (e.g., testosterone propionate, nandrolone phenylpropionate, etc.). The oral drugs used included Dianabol, Turinabol and

Mestanolone, primarily. The doses produced health consequences, along with the obvious physical gains, using doses that would be considered common in many circles of recreational use today (10 - 60 mg/day). Of course, this was anticipated, as these athletes were entered into the doping program prior to or during adolescence, and included female athletes in equal number to the males. With these relatively non-specific AAS, East Germany went from being a defeated and bankrupt country post-World War II to an Olympic powerhouse brimming with national pride. Of course, other countries were involved



in similar programs, just not in as organized and methodical (and documented) fashion.

The current contrived scandal regarding the WADA and IAAF deciding that Russia (and only Russia?) must have a doping program—coincidentally, as it stands in opposition to the United States in many foreign policy matters—has resulted in Russian athletes being at least temporarily banned from international competition.² A travesty to the rule-abiding athletes, and a woeful repeat of the 1980 and 1984 Olympic Games wherein politics stripped athletes of a once-in-a-lifetime opportunity that had been the goal of years of training and sacrifice.

Returning to the topic, Dianabol and similar AAS were very effective at increasing power and strength, as attested to by the gold medal performances of the East German athletes. It is interesting to note that the East German protocols provided lower doses to “skill” athletes as opposed to Olympic lifters and shot-putters.¹ Additionally, these oral AAS are also effective at promoting mass

gains, though not a quality, hardened mass. For that, the more appropriate single agent may be stanozolol or oxandrin, though the amount of mass gained will be considerably less, as will be the strength gains to a degree. This remains true in modern times, as the infamous stripping of Ben Johnson in his record-setting Olympic win was due to the detection of stanozolol, and many Major League Baseball players were reported to test positive for stanozolol as well.

AROMATIZABLE VS. NON-AROMATIZABLE AAS

One factor differentiating the “size/power/strength” AAS and the AAS used by bodybuilders in pre-competition training is the concept of aromatizable versus non-aromatizable AAS. Aromatizable AAS are those that can be converted in the body to estrogenic metabolites—hormones with female sex hormone effects. Yes, this can lead to “bitch tits,” mood disruption and other negative side effects. However, a component of estrogenic stimulation is necessary for maximal size and strength enhancement, an understudied area of research.³ This is why in meat production facilities, such as cattle ranches, a combination of hormones is often used, including tibolone, which contains female sex hormone properties or Revalor-S (trenbolone and estradiol combination).⁴

Those for whom power, strength and size advantages are critically necessary employ the use of numerous agents, as mentioned previously. In addition to stacking two or more AAS, other adjunct drugs are commonly used, depending upon the resources and risk tolerance of the individual. Note well, none of these regimens is being recommended or condoned. Further, as the cycles become more complex, of longer duration, or increase in peak as well as cumulative exposure, the risk of adverse events (i.e., side effects) escalates.⁵

BASE DRUGS MAINTAIN BODY'S RESPONSE TO TRAINING

In the athlete with access to a wide complement of performance-enhancing drugs, it is common to see cycles (or persistent use) hallmarked by a base foundation of drugs, with periodic inclusion of more goal-oriented drugs.

The base drugs, similar to the protocols reported to be associated with athletes exposed during the BALCO scandal, or doping revelations such as occurred with a legion of Tour de France cyclists, including Lance Armstrong, are dependent upon the needs of the athlete.⁶ For power athletes, one needs to factor in the need to accommodate weight-class restrictions, agility or power:mass ratios; similar considerations relating to body mass



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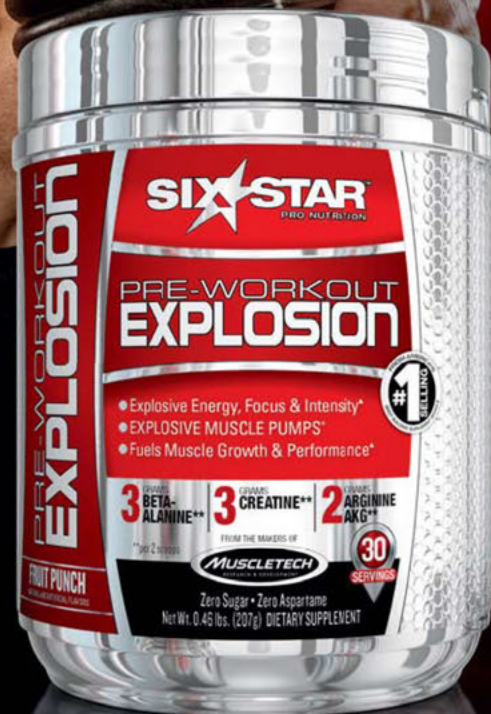


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are relevant for strength athletes as well, given most competitions are weight-class events. Even gains in size need to be moderated for many athletes, either to maintain a restricted weight or to balance symmetry in bodybuilding. Of course, those who compete in endurance events or long-duration competitions have additional needs.

Base drugs essentially need to maintain the body's response to training, tolerate diet and promote metabolic health. It does little good to put on size if one is experiencing depression, type 2 diabetes or insulin resistance, insomnia,

not to completely suppress the effect or presence of estrogens— especially estradiol, as estrogens are involved not only in muscle function and response, but also a myriad of health-related pathways (e.g., lipid and glucose tolerance, cognitive and neuroprotective effects, antioxidant functions, etc.). Other classes of drugs used as performance enhancers are also commonly misused/abused in the quest for power/strength/size. These include insulin; growth hormone/IGF-I; beta-2 agonists and non-specific stimulants (e.g., clenbuterol, Adderall) and others.

The AAS that generally serve the roles of power, strength and size enhancers are trenbolone acetate, Anadrol-50 and testosterone propionate, respectively. This list may surprise many, but consider the factors of each. I refer the reader to William Llewellyn's excellent book for a more comprehensive discussion of each.⁹

Trenbolone, chemically related to THG, serves to enhance muscle growth and differentiation of satellite cells with subsequent fusion of myoblasts to muscle fibers.^{10,11} It is also a "dry" steroid in that it will not add a great deal of body mass aside from muscle growth. These are factors sought in training for power performance, and successful as demonstrated by the Olympic and professional athletes reported in the BALCO scandal and others using THG. Note, THG was used in preference to trenbolone as it was not detectable, not because it held any innate advantage that was reported.

Anadrol-50 is an extremely potent oral AAS that provides rapid increases in both size and strength, and can be dosed to peak immediately prior to or following training. Anadrol-50 also affects the mental and mood state of the misuser, increasing aggression and tolerance to pain. Unfortunately, it is also hepatotoxic (damages the liver), and can cause outbursts and excessive responses to provoked aggression.

Testosterone propionate is an aromatizable AAS, and it has the greatest variation in peaks and troughs following injection. The change in muscle and bone mass seen with testosterone is due to more than the cumulative dose, but to the peak concentration reached, and testosterone propionate results in the sharpest peaks.¹² To attain the same effect with longer-acting esters would result in a prolonged excess in testosterone, and likely result in adverse effects related to DHT or estradiol conversion.

There is the list, one that will be contested hotly, but consider the properties of the drugs relative to the goals being sought. Further, each of these is relatively accessible. Note, again, this is not a recommendation or endorsement. Consider the consequences of any misuse of AAS strongly, and be aware of the many risks that are inherent with the practice. ■

With these relatively non-specific AAS, East Germany went from being a defeated and bankrupt country post-World War II to an Olympic powerhouse brimming with national pride.



etc. Power athletes often experience overuse injuries, over-reaching or over-training states, chronic inflammation, fatigue, hypervigilance and a myriad of other issues. A base of injectable testosterone is nearly always part of a complex cycle, though drug-tested athletes may use a low-dose cream or even oral testosterone undecanoate to maintain a physiologic or slightly elevated testosterone concentration. This maintains the metabolic, endocrine and neurosteroid functions of testosterone. AAS have different properties and metabolites that do not replicate the effect of testosterone, and thus account for many of the challenges involved when testosterone is not maintained.

As many athletes depend upon a total exposure to supraphysiologic, aromatizable AAS to promote maximal gains, both aromatase inhibitors and SERMs (e.g., Nolvadex) are commonly used to minimize the risk of estrogen excess. However, it is important

BEST AAS FOR POWER, STRENGTH AND SIZE?

Now, before unveiling what may be the best AAS for power, strength and size, three final comments. First, in regard to both size and strength, there is a well-described dose-response relationship.⁷ In other words "more is better" with better referring to the gains, not better health or a better decision. Second, everyone has had a personal experience that colors his/her opinion as to what works best. Do not be surprised to see your favorite Baskin-Robbins "31 flavors" of AAS missing. Third, the choices will be based in part on accessibility to the illicit misuser/abuser. It does little good to discuss a THG or nebivolol— two AAS that played a prominent role in the BALCO scandal when they were custom synthesized for a select group.⁸ Granted, they are likely available in certain venues, but not circulating in gym locker rooms.

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Let's face it—packing on slabs of muscle isn't easy. You train hard and eat clean, but getting the body you always wanted still seems like a distant dream. When it comes to getting big, prohormones are in a class of their own. The majority of them have been banned in America, which has left many who loved them with no viable option. So what is a hardcore muscle-head to do?

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I am going to tell you, straight up. If you are one of those guys who talk more than you train in the gym, or wears gloves so his pretty hands don't get calluses, then turn the page now. LG's Bulking Andro Kit is not for the weekend warrior, or the guy who talks about his all-star high school football glory days from 30 years ago. But if you are a die-hard bodybuilder who is looking to pack on as much unadulterated, rock-hard muscle as humanly possible, then look no further. Again, if you're not looking to pack on muscle mass with granite-like density, then this is not for you. But if you are someone who thirsts for newfound muscle like nothing else, then you won't find anything that comes close to this latest anabolic masterpiece.

REAL-DEAL GROWTH

The LG Bulking Andro Kit consists of not one, but four amazing formulations to help you get big and jacked. It is a combination of three powerful anabolic formulas, and concludes with a potent post-cycle therapy (PCT) matrix. This allows you to pack on muscle like a freak, and then recover and maintain the gains you worked so hard to attain. Let's take a look at what's inside this bad boy.

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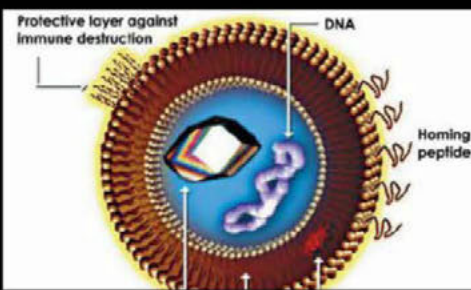
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When the cycle is over, now it's time to bring your natural hormone balance back into action. This is where Form-XT comes into play. This PCT formula will help maintain your results and bring your system back into sync, once you have completed your growth stack.



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Now, as good as this all sounds, the scientists at LG didn't want to stop there. They created Cyclosome Technology to greatly improve the effectiveness of their prohormones. This is the most advanced liposomal delivery technology ever created! It improves the bioavailability of testosterone-boosting compounds and legal prohormones in the body, so they can do what they are supposed to do ... get you huge!

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So, as you can see, LG Sciences has done their homework on this stack. It not only provides you with the most potent, legal prohormones available anywhere, but the Cyclosome Technology takes this formula to a whole new level, above and beyond anything we've seen before.

If you are tired of supplements that don't step up to the plate in terms of results, then now is time to make a choice. You can go with the boring "same old, same old" companies that rehash old ingredients, or you can go with one that is backed by the scientific research to bring you the most cutting-edge products to get you huge. If you are truly looking to transform your physique, then LG's Bulking Andro Kit is just what you need to make it happen! ■

For more information, visit lgsciences.com.



ANABOLIC RESEARCH *UPDATE*

BY WILLIAM LLEWELLYN



CROWD-FUNDED STEROID TESTING

The steroid black market is a mess these days. Pharmaceutical products are scarce. Most of the drugs available are manufactured underground, where poor quality controls, drug substitution and even outright rip-offs are an everyday concern. Consumers don't have a lot of help out there. That's why I take special interest this month in a new site called AnabolicLab.com. It is a crowd-funded platform, where the public makes contributions in support of a planned series of lab tests. When the threshold donation amount is reached, the proprietor acquires the necessary drug selections and sends them off to be examined. The full lab reports are made public. The site is working on its third round of testing right now. So far, they have dozens of reports on some very big names including Alpha-Pharma, Balkan Pharmaceuticals, Geneza Pharmaceuticals, Gen-Shi Laboratories, Eurochem Laboratories and Unigen Life Sciences, to list just a few. This is a great concept, and if nothing else, an excellent site to read during your downtime. I recommend paying it a visit.

LIVER INJURIES COMMON

Today, oral steroids are about as popular as they ever were. In spite of what we know of their potential toxicity, c-17 alkylated agents such as methandrostenolone (Dianabol), stanozolol (Winstrol) and oxymetholone (Anadrol) remain staples on the underground market. Most users know the risk of liver injury is there, but also feel it to be exceedingly unlikely to happen to them. Is that actually the case? A paper published in the journal *Substance Use & Misuse* suggests that actual liver injury may be a bit more common in anabolic steroid users than typically assumed.¹

The paper discusses a study of 182 young steroid users from Brazil. The men ranged in age from 22 to 30. This was a population-based investigation, where the subjects lived freely but were monitored periodically over a period of roughly five years. Each of the men had used steroids for at least six months at the start of the study. What they found over the half-decade period was a surprisingly high incidence of liver injury. The numbers break down like this. A total of 38.8 percent (more than one-third) had elevated liver enzymes. This, of course, is common in steroid users, and often ignored as "not a big deal." Perhaps. However, about 12 percent of the men suffered from hepatic steatosis, also known as fatty liver disease. I would consider this a very valid concern. There were also two cases of very serious disease during the study, cancer in one. However, these were also associated with hepatitis infection.

Even when excluding those men with a history of alcohol or other drug consumption, and existing liver disease, liver injury remained diagnosed in 12.6 percent of the steroid users (about one in eight men). This does suggest that clinically significant issues could be more common than we assume. Perhaps we shouldn't just brush off those enzyme elevations. While the liver is indeed a resilient organ in most cases, it is still subject to injury from anabolic-androgenic steroid (AAS) misuse, as this study shows. Though proper nutrition and the right liver support supplement can go a long way in helping to mitigate this, it is probably a good idea that we all look at our hepatic health just a little more closely from now on.

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Got a question for William Llewellyn? You can ask him directly on the MD website and have William personally answer your question! Go to www.musculardevelopment.com, MD Forums, MD Staff and Pros, Q and A for William Llewellyn.

William Llewellyn's books (*ANABOLICS*, *UNDERGROUND ANABOLICS* and *SPORT SUPPLEMENT REFERENCE GUIDE*) are now available as e-Books on Amazon, Barnes & Noble and iTunes

NEUROREGENERATIVE EFFECT OF OXANDROLONE

Researchers in Italy have presented a new and highly interesting medical case study on oxandrolone.² This time, the drug was used in a patient suffering from Charcot-Marie-Tooth disease type 1 (CMT1)—a neurological disorder characterized by a progressive loss of muscle strength and motor control in the peripheral nerves. Over time, CMT is usually characterized by difficulties walking and using one's hands, even speaking. It is a serious disease, and also one of the most common hereditary neurological disorders. It actually affects about one in 2,500 Americans. CMT is often treated with fairly basic methods that include physical therapy, mobility braces and when needed, pain medications.

The paper in question concerns doctors who were faced with a progressive loss of muscle strength in one of their CMT patients. The decided course of treatment was oxandrolone, given at a dose of 20 milligrams per day for three months. This was combined with strength training three times per week. The result was a significant improvement in muscle strength and functional (walking) ability. Muscle biopsy also showed there was a remarkable improvement in muscle fiber composition and nerve density. The drug seemed to be directly countering (reversing) some of the physiological effects of the disease on the muscles.

If you know someone suffering from CMT, take note! The implications here are perhaps even broader. Though a single case study, it does seem to lend yet one more thin fiber to the growing cable of support for expanding the use of anabolic agents in modern clinical medicine. We'll be sure to keep you posted on updates and similar stories.



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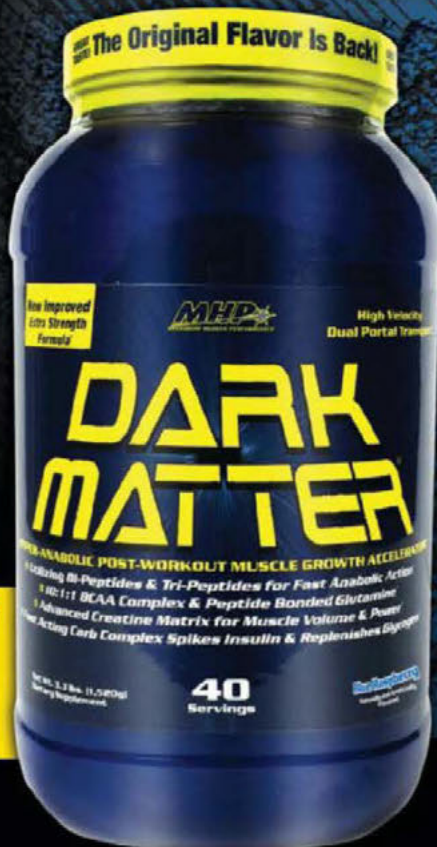
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ANABOLIC RESEARCH *UPDATE*

STEROIDS MOST LIKELY TO BE FAKED

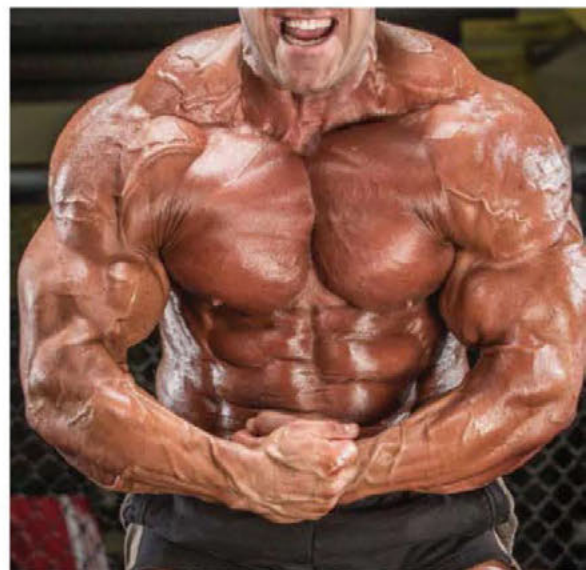
I know you follow steroid testing often. I was wondering what the extremes are. Just on blind odds, what are the steroids most and least likely to be faked? In other words, what would I have good odds with, and what should I probably stay away from?

That is difficult to say with much certainty. Unfortunately, we have so few snapshots of underground drug quality. Law enforcement rarely makes the analysis results on seized drugs public, so we only get a report or two each year to examine, usually from university studies or private sources. So, in answering your question I will be giving you my opinion. This is based simply on the limited testing I've done on black-market steroids over the years, as well as my impressions from other papers I've read.

First, the least likely to be faked is probably testosterone. Among the esters, enanthate is probably your best bet. As a raw material, testosterone enanthate is just so cheap and readily available. Furthermore, there isn't as much financial incentive to replace it with other drugs. Most anything you'd put in at a lower dose/cost will have a less substantive effect, and in turn you will disappoint your customers. With that said, plenty of underground labs and counterfeiters still find ways to cheat you on your testosterone purchases. Nothing is safe these days. But just running the odds, you are probably least likely to lose your money here.

On the other end, I'd say there is Anavar (oxandrolone). This drug is highly expensive as a raw material. Its effect is also subtler than most other steroids. Of course, oxandrolone is often specifically sought after for this reason (its mild nature). This creates both great incentive and opportunity for the counterfeiter. It is easy to substitute oxandrolone with another drug, and if you are smart, something that also non-estrogenic like stanozolol or methasteron. These drugs are much cheaper and further, much more potent, milligram for milligram. The mild results from a low dose of either will match the expectations of oxandrolone in most users. Few would suspect drug substitution. The "take" on this practice for an unscrupulous producer can be quite high.

Of course, the whole black market is a crapshoot these days. There are good and bad examples of every drug compound to be found. As such, everything needs to be examined on an individual basis. I wouldn't make any sweeping judgments based on drug compound alone. As always, be careful, and be safe.



MASTERDROL BLACK

Have you ever heard of the prohormone Masterdrol Black? What do you think of it? Is this supplement any good?

Masterdrol Black is a gray-market "supplement" product circulating the U.K. right now. I use the word supplement in quotes, as its main ingredients aren't actually items of dietary origin, which of course is the basic definition of a dietary supplement. Instead, it contains two synthetic anabolic steroids, methasteron (better known as Superdrol) and Trenavar (trendione). Trendione might technically be classified as a prohormone, given that it should have low intrinsic activity and does assumedly convert to trenbolone in the body, to some degree. Methasteron, however, is a long-known and highly potent oral anabolic steroid. Both compounds have a formidable history of use in the United States, where they were quite popular as "pro-steroid supplements" until very recently. Each had a reputation for significant size and strength gains, with little water bloat. In fact, methasteron is regarded by many as being one of the strongest oral steroids of all time (standing next to Anadrol).

As I mentioned, technically these are not dietary supplements. In fact, these drugs were scheduled as controlled substances in the United States a couple of years back. Selling this product, even possessing it here, could land you in a heap of trouble. Legally and pharmacologically speaking, these compounds are just like all of the other common anabolic steroids. If that is what you were looking for, I guess you found it. I would caution you, though. The dose is high here (10 mg + 30 mg), and methasteron especially has a reputation for being quite harsh. It has made more than one person sick due to its high level of liver toxicity. I would not assume it's mild, just because you purchased it at a store.

Incidentally, the name Masterdrol had long been associated with products from LG Sciences, a U.S. supplement company. Reuse of the mark here might constitute infringement, but I'm no expert. Then again, if you are still selling these compounds as supplements in 2016, trademark infringement is probably the least of your concerns. ■

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BOOST YOUR BENCH AND SQUAT TILL YOU DROP!

The bench press and squat are the ultimate exercises for building upper and lower body strength, respectively. Correctly performed, these two lifts can dramatically increase strength and power, enhancing athletic performance, while also stimulating tremendous muscle growth. While many advanced bench press and squat techniques routinely manipulate training intensity and volume in a pretty straightforward way to enhance strength, some uncommon training methods exist that have a more unconventional impact on training intensity and volume, resulting in extraordinary strength gains in the bench press and squat.

ACCELERATE YOUR BENCH PRESS STRENGTH

Bench pressing a loaded bar with greater acceleration, while being careful not to cause injury, potentially increases the intensity of the lift, which preferentially activates fast-twitch muscle fibers, ultimately promoting their hypertrophy. The targeted growth of the superior force-producing fast-twitch muscle fiber results in larger strength gains, making this bench-press technique an optimal way to boost your bench press.

In addition, a recent study by Liu et al.¹ confirmed that rapidly accelerated bench pressing can also stimulate the conversion of slow-twitch muscle fibers to fast-twitch muscle fibers, further validating the use of this training approach for optimal strength gains in the bench press. In this study, test subjects were split into two groups. One group performed standard-velocity bench presses, and the second group performed both normal-velocity bench presses on day one of the protocol, and then accelerated bench presses with 30 percent of their one-repetition maximum (1RM) during the next scheduled workout. The results showed that the group performing a combination of regular and accelerated bench presses increased the fast-twitch fiber type by 15 percent, while decreasing the slow-twitch fiber by a similar amount, indicating that high-velocity movements stimulated the conversion of slow- to fast-twitch fiber.

Altogether, the ability of high-velocity bench press movements to increase both the size and number of fast-twitch muscle fibers indicates that this approach to the bench press is a very effective way to enhance bench press strength.

MAXIMIZE BENCH PRESS STRENGTH WITH PARTIAL-REP TRAINING

The bench press movement requires the sequential activation of several different muscles, primarily consisting of the pectoralis, deltoid and triceps. The transitional

activation of these different muscle groups throughout the bench press movement tends to decrease overall force production at specific points of the upward phase of the bench press. When this drop in force production combines with a poor biomechanical position of the involved muscle groups, and their associated joints, during the concentric part of the bench press movement, there is a considerable drop in the speed of the barbell—which is often referred to as the sticking point. The sticking point significantly contributes to the inability to complete the bench press movement, hindering the training effect. Minimizing the negative impact of the sticking point on bench press performance has been shown to improve bench press strength.

One of the more productive training approaches used to minimize the negative impact of the sticking point on the bench press, and improve bench press strength, involves breaking up the bench press movement into different phases by using partial range of motion (ROM) training. The concentric portion of the bench press movement can be separated into pre-sticking, sticking and post-sticking phases. Partial ROM training within the pre-sticking phase of the bench press has been shown to reduce the negative impact of the sticking point on bench

press performance, because greater force can be generated during the pre-sticking phase of the bench press relative to the other two phases of the bench press movement. The relatively superior force generated within the pre-sticking phase of the bench press permits the use of heavier weights—which, over time, will more effectively improve full ROM bench press strength.

In addition, improvement of muscular force production during the pre-sticking phase caused by partial ROM training within the pre-sticking phase improves the capacity to generate greater momentum within the pre-sticking phase of the bench press. As a result, when performing full ROM bench presses, the greater momentum produced within the pre-sticking phase will promote movement of the bar through the sticking point, further mitigating the negative influence of the sticking point on bench press strength—resulting in greater overall bench press strength.

Demonstrating the influence of partial ROM training on strength, a study by Graves et al.² looked at the influence that partial ROM training had on strength gains. In this study, test subjects were randomly assigned to a partial ROM group performing their training in the pre-stick phase, and a full ROM group. Prior to and after training, muscular strength was assessed for the full and



partial ROM groups, with the results showing that partial ROM training had the greatest impact on strength gains.

Although partial ROM training within the pre-sticking phase can be very effective, other studies show that partial ROM training impacts strength mostly within the ROM that is trained, meaning partial ROM training within the pre-sticking phase tends to have a greater influence on pre-sticking phase strength than the other two phases of the bench press movement. This effect suggests that partial ROM training should be performed within all three phases of the bench press in order to improve strength throughout the entire range of the bench press movement, an approach known as mixed ROM training.

The positive influence of mixed ROM training on bench press strength was demonstrated in a study by Clark et al.³ where they compared the ability of mixed ROM training to improve bench press strength to that of full ROM training. The results showed that mixed ROM training improved bench press strength much more effectively than full ROM training.

OPTIMAL TRAINING VOLUME FOR THE SQUAT

Most weight-training programs focused on developing squat strength typically have a set range of three to five sets. While three to five sets can effectively elicit strength, is it the optimal amount of sets for maximal strength gains? According to a study by Marshall et al.⁴, the answer to this question may, in fact, be a resounding no.

In the above study, researchers showed that subjects performing eight sets of squats at 80 percent of their 1RM had the greatest increase in strength, of almost 25 percent. The other two groups in this study doing only one set and four sets showed an increase in strength of only 10 percent and 14 percent, respectively. While this is only one study, the results clearly indicate that performing as many as eight sets at a relatively high intensity

produces a significantly greater improvement in strength. So, if you are looking for an effective way to boost squat strength, consider gradually increasing the number of sets performed during your squat workout to eight, for a potent training effect that should boost squat strength significantly.

BOOST SQUAT STRENGTH WITH CLUSTER SETS

Another training method that increases training volume involves the use of cluster sets. Cluster set training involves breaking up one complete set into “mini-sets” where you only perform roughly one-third of the total repetitions that you would normally perform for a complete set. After the first mini-set, you rack the weight and wait 10 to 30 seconds— and then perform successive mini-sets, until you surpass the total number of repetitions that you would normally perform without interruption, by at least one repetition.

As an example of cluster set training, let's say you can squat 405 pounds for five successive repetitions. Well, during a cluster set, you would lift 405 pounds for the first mini-set within the cluster for two repetitions, rack the weight, wait for 10 to 30 seconds and repeat two more times, or for two more mini-sets, within the first cluster. This would give you a total of six repetitions with 405 pounds, meaning you've effectively performed one more repetition within the cluster set than you normally do during a regular set, effectively increasing training volume.

The greater training volume while performing cluster sets provides quite a training effect that fosters considerable gains in strength. In one study, 18 highly trained athletes were divided into two training groups, with one group performing a traditional training squat workout, and the other group performing a cluster set training squat workout.⁵ The group performing cluster sets increased strength and power much more than the traditionally trained group, demonstrating the ability of cluster set training to bolster strength. ■

CORRECTLY PERFORMED, THESE TWO LIFTS CAN DRAMATICALLY INCREASE STRENGTH AND POWER, ENHANCING ATHLETIC PERFORMANCE, WHILE ALSO STIMULATING TREMENDOUS MUSCLE GROWTH.



For most of Michael Rudolph's career he has been engrossed in the exercise world as either an athlete (he played college football at Hofstra University), personal trainer or as a research scientist (he earned a B.Sc. in Exercise Science at Hofstra University and a Ph.D. in Biochemistry and Molecular Biology from Stony Brook University). After earning his Ph.D., Michael investigated the molecular biology of exercise as a fellow at Harvard Medical School and Columbia University for over eight years. That research contributed seminally to understanding the function of the incredibly important cellular energy sensor AMPK— leading to numerous publications in peer-reviewed journals including the journal *Nature*. Michael is currently a scientist working at the New York Structural Biology Center doing contract work for the Department of Defense on a project involving national security.

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TIME-TESTED **MUSCLE-BUILDER** STEPS FURTHER INTO THE FUTURE

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goals. Now, the brand has further evolved with the latest introduction of NITRO-TECH® POWER, a supercharged formula that MuscleTech® researchers are calling, "Our most powerful muscle-building performance protein yet." What makes it so powerful? We examined what went inside this plateau-propelling formula, and put that bold statement to the test.

WHAT MAKES IT SO POWERFUL?

Like all MuscleTech® formulas, the core ingredients in NITRO-TECH® POWER are fully disclosed and backed by scientific research, a supplementation stipulation this 20-year brand was built on.

For this particular formula, MuscleTech® researchers started by packing a fully researched six-gram dose of creatine monohydrate into every two scoops of NITRO-TECH® POWER. In a double-blind, placebo-controlled study published in *Medicine & Science in Sports & Exercise*, subjects supplementing with this same dose of creatine gained 11 pounds of mass in just 12 weeks, in comparison to 7.5 pounds gained by the placebo-only group.

Their progressive research team didn't stop there, either, also adding a scientifically validated 2.5-gram dose of betaine in two scoops. That researched dose of betaine has been shown in multiple studies to increase strength and lean muscle. In fact, in one gold-standard study published in the *Journal of the International Society of Sports Nutrition*, subjects gained 3.75 pounds of muscle in six weeks, while the placebo group only 0.66 pounds during that same time period. That's over five times the muscle!

To help build more muscle, a double scoop of NITRO-TECH® POWER also delivers 14.8 grams of branch-chained amino acids (BCAAs), including eight grams of highly anabolic leucine, which ignites protein synthesis and puts an athlete's

body in a prime anabolic state. It's in this highly stimulated state that athletes are able to push past their plateaus and build more muscle and strength than ever before. A study published in the *International Journal of Sports Physiology and Performance* indicated that the amount of leucine found in just a single scoop of NITRO-TECH® POWER has been scientifically shown to increase strength by over 40 percent.

Also included in this formula is an 480-milligram dose of tart cherry powder (per two scoops). Emerging research published in the *British Journal of Sports Medicine* indicates tart cherries can improve recovery through the reduction of muscle soreness, post-exercise.

To enhance ATP regeneration—a function needed for the biochemical reactions involved in a muscle contraction—the potent dose of creatine found in of NITRO-TECH® POWER has been scientifically shown to help the body regenerate energy stores that become depleted during resistance training.

And finally, MuscleTech® also added a scientifically studied 200-milligram dose of boron citrate (per two scoops), supplying a dose of boron that has been shown to increase free testosterone and decrease estradiol within the normal range in only seven days.

Not only could this very well be their most powerful muscle-building performance protein, based on the science behind the core ingredients we evaluated, it's arguably the most complete muscle-amplifying protein available to athletes today. We examined another protein, and it just didn't stack up.

CONCLUSION

MuscleTech® researchers have created the ultimate muscle-amplifying protein formula. NITRO-TECH® POWER gives athletes the essential building blocks they need to build muscle like only the science behind this formula provides. ■

Product	Protein	Total BCAAs	Leucine	Creatine	Betaine	Tart Cherry	Boron Citrate
NITRO-TECH® POWER	60g	14.8g	8g	6g	2.5g	480mg	200mg
Competitor	40g	11.98g	6.66g	2g	None	None	None



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- Accelerates recovery after exercise
- Tastes amazing and mixes instantly
- Available in Deluxe Chocolate and Deluxe Vanilla

¹Subjects combining the core ingredients in MuscleTech® 100% Premium Whey Protein Plus (creatine and whey protein) with a weight training program gained 70% more lean muscle than subjects using regular whey protein (8.8 vs. 5.1 lbs.). Read label before use. © 2015

Available at



EARLY MENTORS: WHO SHOWED YOU THE ROPES?

DID YOU HAVE ANY MENTORS IN YOUR EARLY YEARS OF TRAINING, ANYONE WHO HELPED YOU LEARN THE BASICS OF HOW TO TRAIN AND EAT LIKE A BODYBUILDER? OR DID YOU HAVE TO FIGURE THINGS OUT ON YOUR OWN? AND HAVE YOU EVER HELPED ANYONE THAT WAY YOURSELF?

Dexter Jackson

When I first started bodybuilding, I was on my own. It wasn't until I had already been competing for a couple of years, and I was 23 or 24 years old, that I started working with a local trainer in Jacksonville named Skip Sylvester. Until then, I had been just lifting weights, like I had been doing as a football player. He showed me the proper form on various exercises so I could start feeling the contractions, and got me doing things like deadlifts, which I hadn't been doing. From then on, I wasn't just moving the weights—I was squeezing the muscle and controlling the negative.

As far as nutrition information, I got most of that from reading the magazines. I still didn't realize the huge part nutrition played in bodybuilding for a while, though. One thing I never did for most of my career was to weigh and measure my food. I would just figure a chicken breast is a chicken breast, a potato is a potato and so on. It wasn't until I started working with George Farah about five years ago that I began being more exact with how much of everything I was taking in, and it did make a difference.

I can't say I've taken many bodybuilders under my wing, though I have answered a lot of questions and given guidance here and there. I have done that on a much more formal basis with my Team Blade athletes. We have about 70 girls at any given time. In fact, two of them competed with me at the last Olympia and both placed in the top 10. One was in Bikini and one was in Figure. Even Hany and George can't say they've done that!



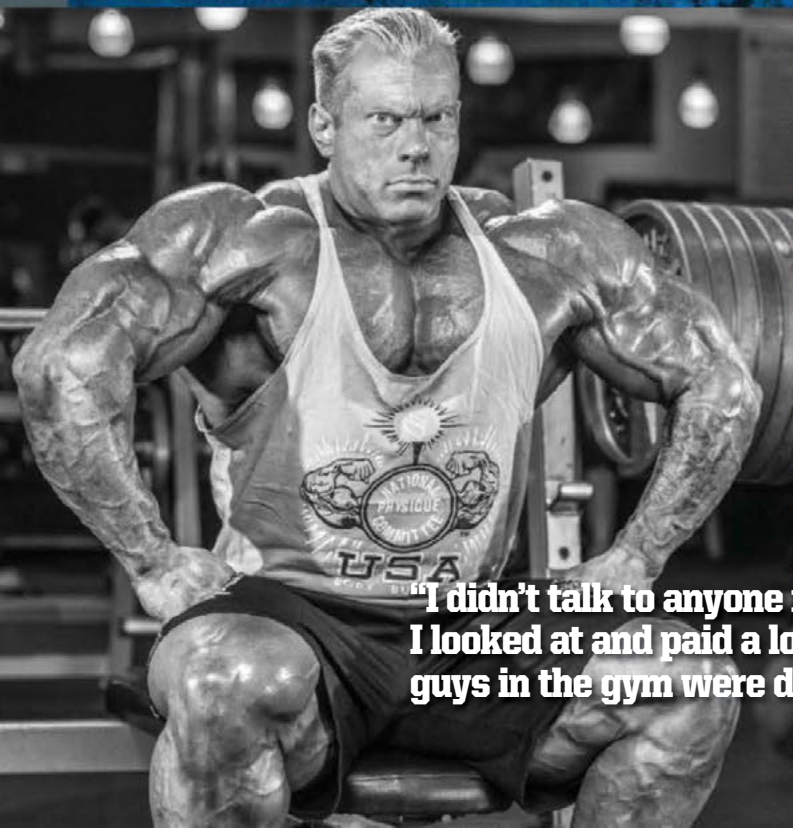
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When I first started training, I didn't talk to anyone in the gym and no one talked to me. But I looked at and paid a lot of attention to what the older, bigger guys in the gym were doing and I imitated them. I began buying magazines, sometimes the American ones, but especially the German magazine *Sport Revue* published by Alfred Busek. That gave me a lot of good information.

About a year later, when I was getting ready to enter my first contest, a man named Mike Schulz took me under his wing and put me on my first contest diet. Until then, I had only this idea that I should eat a lot of food, but I didn't understand the difference between regular food and the types of foods that bodybuilders eat to get lean. So Mike was the man who taught me how to eat like a bodybuilder, and from then on I started getting better results from my training too, of course.

During the last few years I lived in Germany, I was already a pro, so I had a lot of guys coming to me for advice. They would ask me to take a look at them and see what they should work on more, or they would have questions about diet or training. I was always happy to help them out, because I never forgot how confusing it is when you are starting out and trying to figure all these things out on your own.

"I didn't talk to anyone in the gym and no one talked to me. But I looked at and paid a lot of attention to what the older, bigger guys in the gym were doing and I imitated them." -Dennis Wolf



IF YOU TRAINED DIFFERENTLY, WOULD YOU LOOK THE SAME TODAY?

DO YOU THINK THAT IF YOU HAD TRAINED VERY DIFFERENTLY ALL THESE YEARS, DOING MUCH HIGHER OR LOWER REPS, OR USING A LOT MORE OR LESS FREE WEIGHTS VERSUS MACHINES, ETC., THAT YOU WOULD LOOK VERY DIFFERENT FROM HOW YOU DO TODAY? OR DO YOU THINK ANY FORM OF HARD TRAINING WOULD HAVE GIVEN YOU PRETTY MUCH THE SAME PHYSIQUE? WHY OR WHY NOT?

Dexter Jackson

It's kind of a weird question, because I don't think any of us really train that differently. People say Ronnie and Dorian had very different training styles. But did they really? Ronnie used more volume, trained body parts more often and his form was looser, but he and Dorian both trained super heavy. And they both got banged up from it.

I have always trained as heavy as I could. For most of my career, I used mainly free weights and relied on bench presses, squats, deadlifts, barbell rows and so on. More recently, I switched over to more machines. But I still go heavy, and the reps haven't changed a whole lot. Still, it's a big change to go from mostly free weights to mostly machines. You would expect that I would have lost some mass, right? Nope. I'm bigger than I've ever been.

I don't think I would have been able to build all the mass I have if I had only used machines, though. I might have maxed-out at around 200 or 210 pounds of muscle instead of 240. Same thing if I had always done higher reps. Any time I tried using higher reps for

a while, I found I was starting to lose muscle fullness and density. So if my reps had been 12-15 or higher all the time instead of right around 10, I wouldn't have built all the mass that I did. I am pretty sure about that.

Dennis Wolf

I don't think I or anyone else can really answer this question because really, how would you ever know? That's like asking how would someone's life be different if they had some other career the whole time, or if they did or didn't get married, did or didn't have kids, etc. Dorian and Ronnie both had very different styles of training compared to what I have always done. If I had trained like either one of them, would I look very different? I have to think I would still look pretty similar to the way I do now. I have very good genetics for bodybuilding. All the top pros do. I think that any type of hard weight training is going to work pretty well for someone with that type of genetics. Maybe I would have gotten bigger a little faster training the Dorian way or the Ronnie way. I guess I will never know!



PROTEIN SOURCES: EAT A WIDE VARIETY?

SOME PEOPLE FEEL IT'S IMPORTANT TO EAT A WIDE VARIETY OF PROTEIN SOURCES EVERY DAY. FOR INSTANCE, IN ONE DAY THEY MIGHT EAT EGGS, CHICKEN, FISH, TURKEY AND RED MEAT AT DIFFERENT MEALS. THIS IS BECAUSE THEY EACH HAVE A SLIGHTLY DIFFERENT AMINO ACID PROFILE. OTHERS DON'T BELIEVE IN THAT, AND WILL EAT ALL-CHICKEN MEALS OR ALL-FISH MEALS, ESPECIALLY WHEN THEY ARE DIETING. WHICH OF THOSE DO YOU DO, AND DO YOU THINK IT MAKES A DIFFERENCE?

Dexter Jackson

I don't think eating a variety of different protein sources matters when it comes to building muscle or maintaining muscle. As far as I'm concerned, protein is protein. The only reason I switch up my sources is because it would drive me nuts to eat the same thing. Who the hell wants to eat chicken and only chicken, all the time? As it is, I only eat three different types of protein when I diet: chicken, steak and fish. And I get pretty sick of those after a while, too. I'm not one of those guys who love eating six meals a day. If I could look as good eating only twice a day, I would.

Dennis Wolf

I do think it's a good idea to eat a variety of protein sources, and I get three or four a day plus a protein shake. When I am in prep mode, I like to eat chicken pre-workout and red meat post-workout. My later meals tend to be fish. When I am in the final few weeks of dieting, I will eat more red meat meals if I see I am starting to get flat. Red meat helps me stay full. If I am a little behind and not getting lean as fast as I would like, I will eat more white fish meals as they are lower in fat and calories. In the off-season, every day I will usually eat eggs, chicken, bison and a protein shake.





"MY SELF-ESTEEM HAD BEEN DEVASTATED. I KEPT THINKING THAT MAYBE THIS BODYBUILDING SPORT REALLY WASN'T FOR ME."

KAI GREENE: THE EARLY YEARS *WHY HE CAME CLOSE TO QUITTING*

KAI, I KNOW YOUR PATH TO SUCCESS IN THE SPORT OF BODYBUILDING WAS A LONG AND ROCKY ONE. DID YOU EVER COME CLOSE TO ACTUALLY QUITTING AT ANY POINT ALONG THE WAY?

Yes, I did. Some of you know that I earned my pro card by winning the overall at the 2004 NPC Team Universe. Fewer know that I had also won the overall there in 1999, on my third try. My first attempt had been in 1997. That was my first year competing in the NPC after being with a natural organization, and the Team Universe was something of a rude awakening. As a "pro" in the other organization, I had beaten men in their 30s and 40s when I was still a teenager. I honestly thought I had seen and beaten the best natural athletes in the country. Once I got a look at the eventual heavyweight and overall winner, Robert Washington, I knew that assumption had been made in ignorance. Never before had I seen a drug-free competitor carrying so much mass and in excellent condition. You could see the fibers in his glutes when he walked! I took second to Robert, and rightfully so.

The next year, 1998, I took third behind Skip La Cour and Les Jennings. Skip raised the bar for condition that year, and helped motivate me to raise my own standards. In 1999, I finally won. At that time, the Team Universe was not a pro qualifier. After rigorous drug testing, the class winners formed the United States team that was sent to the IFBB World Championships. There, you went up against the athletes representing dozens of nations. I was thrilled to have the opportunity to travel to Slovakia for this tremendous honor and privilege, and I desperately wanted to bring home the gold for myself and my country.

Unfortunately, I placed sixth. After results for banned substances came back positive for two heavyweights from the Russian team, I moved up to fourth. The winner was Francisco "Paco" Bautista from Spain. Fourth in the world may

have seemed like an amazing accomplishment, but it felt like a failure to me (is it just an eerie coincidence that exactly 10 years later, the same thing would happen at my first Mr. Olympia?). So much for the gold—I hadn't even taken the bronze. And because the show was held over in Eastern Europe, almost nobody back in America even knew it had happened.

I went through a very dark period in the years following that IFBB World. My self-esteem had been devastated. I kept thinking that maybe this bodybuilding sport really wasn't for me like I had dreamed it would be, and I couldn't imagine ever competing again. It would be a full five years until I did. That came about while I was living in Jacksonville, Florida. I was training simply for the love of it, and had started dieting a bit so I could use myself as a photographic model for a series of paintings I planned on doing. While I was on my extended hiatus, the Team Universe had become a pro qualifier and as I started looking better, the idea of competing in it again and winning started to become more appealing. I moved back to Brooklyn and returned to Fifth Avenue Gym, and I did go on to win the Team Universe again in 2004.

In 2005, the long-running IFBB Night of Champions became the New York Pro, and I made my pro debut right there in my hometown. With my limited knowledge and experience, I managed 14th place. Friends tried to commiserate with me because they assumed I was upset, but in actuality I was happy. I had been able to perform my posing routine by virtue of making the top 15, and I had still beaten 18 other pros. I had taken a licking, but I got some licks in, too. It wasn't the most auspicious debut by any means, but I knew that now I was on my way.



JUSTIN COMPTON: EATING TO GROW

DIET AT 12 WEEKS OUT

CAN YOU GIVE AN EXAMPLE OF A TYPICAL DAY OF EATING FOR YOU AT 12 WEEKS OUT FROM A SHOW?

Twelve weeks out is usually when I start cutting things back on my diet. Every year it has been slightly different, depending on how I am looking, but for my NPC Nationals prep, at 12 weeks out I was eating about 6,500-7,000 calories. I don't remember the exact diet, but my food was very simple: oatmeal, brown rice, white rice, yams, and red potatoes as my carb sources, and I eat 90/10 ground beef (sometimes sirloin steak), chicken and whey isolate as my protein. My fats come from oils at that time. I cut the fats back and switch over to more fish as I get closer to showtime, but again, it all depends on how my body is responding.

EATING FOR A SMALLER WAIST

HEY JUSTIN, DO YOU THINK FOOD AND CERTAIN EXERCISES OR WEARING A BELT WILL CONTRIBUTE TO A SMALLER WAIST?

I rarely ever wear a belt, so I can't say whether that is a contributing factor. As for food, everyone will respond differently. I feel food can definitely distend the stomach if you are trying to force yourself to eat something that doesn't agree with your GI tract. I have played around with different foods long enough to know what works better for me than others. For example, I can handle some almonds here and there, but if I eat them daily, it's not a good scene. However, cashews and peanut butter are great, no issues at all. If your stomach is distending, then you may need to look into changing up the diet some.

BUILDING SIZE WITH AND WITHOUT COACHES


JUSTIN, WHEN DID YOU START TRAINING FOR BODYBUILDING? AT 25, YOU ALREADY HAD THE MASS OF A 15-YEAR VETERAN! DO YOU HAVE A COACH/GURU HELPING WITH YOUR PREP, OR DO YOU TYPICALLY DO IT ON YOUR OWN?

I started playing with weights when I was 15, giving me 12 total years of "weight training" so far. I started getting very serious with bodybuilding at 18 when I entered my first show. As for coaches, I have had various coaches over the years— all of which I have the upmost respect for, as none of them has let me down. Currently, I am doing my own thing.

SHOULD A BODYBUILDER EAT PORK?

JUSTIN, WHY DO YOU EAT PORK? I THOUGHT THIS WAS BAD FOR ANYONE, ESPECIALLY SOMEONE WHO REALLY WANTS TO LOOK HIS BEST.

I like to keep a variety of sources for all my food. This isn't a staple, so to speak, of my diet and I certainly don't eat it every day or even every week. I always get the pork loin center cut the leanest I can, and I will also do some hand trimming of the meat as well. Pork has always been a food I loved, so in my off-season I incorporate it into my diet.



"I HAVE HAD VARIOUS COACHES OVER THE YEARS— ALL OF WHICH I HAVE THE UPMOST RESPECT FOR, AS NONE OF THEM HAS LET ME DOWN. CURRENTLY, I AM DOING MY OWN THING." -JUSTIN COMPTON

EARLY MENTORS: WHO SHOWED YOU THE ROPES?

DID YOU HAVE ANY MENTORS IN YOUR EARLY YEARS OF TRAINING, ANYONE WHO HELPED YOU LEARN THE BASICS OF HOW TO TRAIN AND EAT LIKE A BODYBUILDER? OR DID YOU HAVE TO FIGURE THINGS OUT ON YOUR OWN? AND HAVE YOU EVER HELPED ANYONE THAT WAY YOURSELF?

I actually was lucky enough to have a mentor when I was starting out at age 16-17. I worked at a car dealership as a salesman, and he was one of my bosses. His name was Victor DiDonato. He was 10 years older than me and had recently immigrated to the USA from Italy, where he had competed extensively in bodybuilding. Victor's English wasn't the greatest, but he was still able to show me all the basics in the gym. Victor taught me how to train, how to eat and showed me the work ethic and consistency it took to succeed in the sport. He had hoped to continue competing himself, but at the time he had to focus on working and establishing himself financially. But Victor easily saved me at least five years of making mistakes, plus thousands of dollars I would have had to pay a coach.

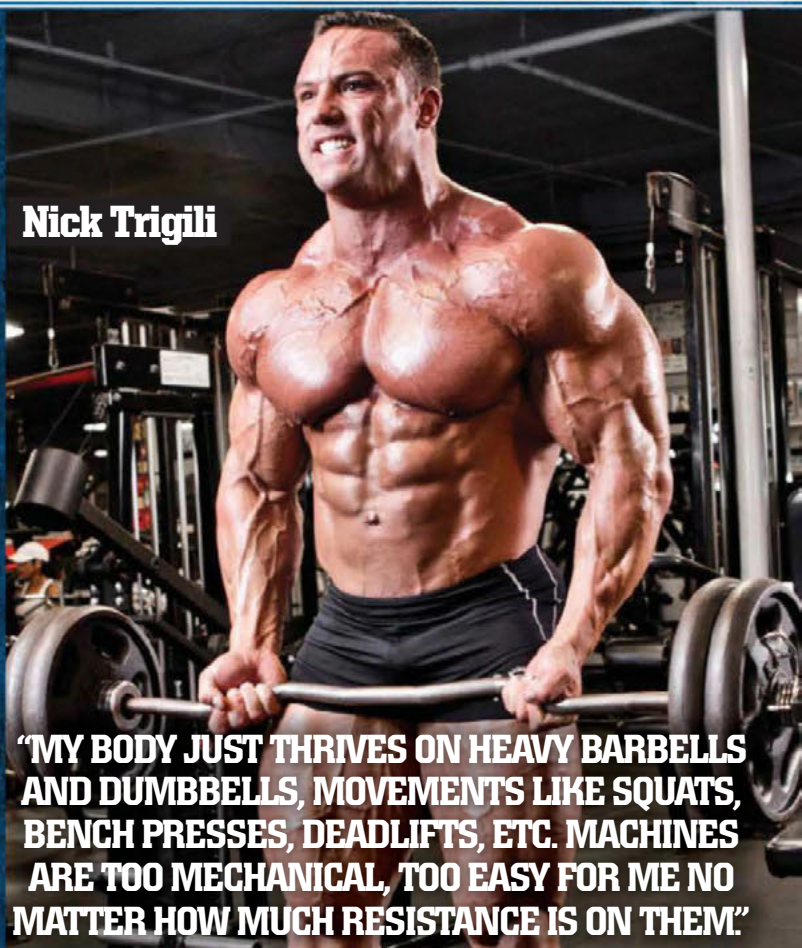
Later on, I was able to help out Dallas McCarver. We met through John O'Regan, who was coaching both of us at the time. John asked me to give him a call and help him out, because he was very new to the sport and could use a friend who knew his way around things. John assured me we would get along great, which I thought was hilarious at the time. Here I am, this Italian guy from New Jersey, and Dallas is this big old country kid with an Alabama accent. Total opposites. Dallas was going through some things, having just ended his college football career not too long before, and not being sure if there was any real future for him in this bodybuilding stuff. I helped Dallas dial in for the 2012 North American. He was so nervous. It was his first national show, after winning a local show and then a state show. I wound up getting fifth place in the supers, and he won our class and the overall! We're still really good friends. I'm kind of like his big brother.

PROTEIN SOURCES: EAT A WIDE VARIETY?

SOME PEOPLE FEEL IT'S IMPORTANT TO EAT A WIDE VARIETY OF PROTEIN SOURCES EVERY DAY. FOR INSTANCE, IN ONE DAY THEY MIGHT EAT EGGS, CHICKEN, FISH, TURKEY AND RED MEAT AT DIFFERENT MEALS. THIS IS BECAUSE THEY EACH HAVE A SLIGHTLY DIFFERENT AMINO ACID PROFILE. OTHERS DON'T BELIEVE IN THAT, AND WILL EAT ALL CHICKEN MEALS, OR ALL FISH MEALS, ESPECIALLY WHEN THEY ARE DIETING. WHICH OF THOSE DO YOU DO, AND DO YOU THINK IT MAKES A DIFFERENCE?

I don't think it makes much of a difference at all. In fact, I get most of my protein from whole eggs and lean red meat. I will eat chicken at times, but not too often. As for fish, very rarely will you see me eating that. People freak out about the fat content in red meat, but I go for very lean cuts and 98 percent lean ground beef. It's not like I'm eating rib-eyes every day. But no, I don't believe there is any special benefit to eating a wide variety of protein sources. Protein is protein. I've tried mixing up the sources before at times, and I saw no difference at all.

Nick Trigili



"MY BODY JUST THRIVES ON HEAVY BARBELLS AND DUMBBELLS, MOVEMENTS LIKE SQUATS, BENCH PRESSES, DEADLIFTS, ETC. MACHINES ARE TOO MECHANICAL, TOO EASY FOR ME NO MATTER HOW MUCH RESISTANCE IS ON THEM."

IF YOU TRAINED DIFFERENTLY, WOULD YOU LOOK THE SAME TODAY?

DO YOU THINK THAT IF YOU HAD TRAINED VERY DIFFERENTLY ALL THESE YEARS, DOING MUCH HIGHER OR LOWER REPS, OR USING A LOT MORE OR LESS FREE WEIGHTS VERSUS MACHINES, ETC., THAT YOU WOULD LOOK VERY DIFFERENT FROM HOW YOU DO TODAY? OR DO YOU THINK ANY FORM OF HARD TRAINING WOULD HAVE GIVEN YOU PRETTY MUCH THE SAME PHYSIQUE? WHY OR WHY NOT?

I can honestly say I know the answer to this. When I first started out, the gyms I trained at in New Jersey were very basic. There weren't a lot of machines at all, just tons of free weights. That's pretty much what I used to build all my mass. Then I moved to Las Vegas for two years, and the gyms there have every type of equipment you can imagine. From there, I went to live in Los Angeles for two and a half years and trained with Charles Glass. Charles is an amazing trainer, but he does like to use mostly machines with his clients. He pushed me hard, but after a while I finally had to realize I had lost

a lot of my mass and density. My body just thrives on heavy barbells and dumbbells, movements like squats, bench presses, deadlifts, etc. Machines are too mechanical, too easy for me no matter how much resistance is on them. Once I switched back to almost all free weights, my physique started looking bigger and better again. And, I went from taking fifth place at the 2012 North American to winning the super heavyweight and overall titles at the 2014 USA. If that isn't proof enough that free weights work better than machines for me, I don't know what is.



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The Gifted One

BY RON HARRIS

WITH 5-TIME MR.
OLYMPIA PHIL HEATH



Phil's Thoughts After Winning His 5th Mr. Olympia

Right after Phil Heath walked offstage with his fifth consecutive Mr. Olympia title, Arnold Classic Australia promoter Tony Doherty pulled him aside to get his immediate reaction and thoughts. Here are the highlights.

ON HIS LACKLUSTER APPEARANCE FRIDAY, AND REMEDYING IT FOR SATURDAY

"I just know that yesterday was a devolumized Phil Heath, and when I'm devolumized, I'm not gonna be as confident, because I know in years past I've shown the

IMAX 3-D look with everything pushing. Thank God for my trainer. Thank God that we were able to go back to the drawing board, found out even what's worked in previous years and then scratch that, and then find out what's currently going on, and then see what we need to do, food needed to eat, and then overall it's just ... man, thank goodness we were able to do what we do best, which is win, and find the solution. You know, when I was backstage and pumping up, I know that Saturday I'm always a little better. I put on a new tan, and that helped. Everything started to flow, and I started to get into my groove. So Friday is like my warm-up, mentally and physically. Maybe part of it was the expo. Being at the expo and meeting all the fans, and all the positive people that came by."

MY NOTE ON THE TWO-DAY CONTEST FORMAT

The two-day format of the Mr. Olympia, which was initialized in 1997, has been the saving grace for both Phil and Jay Cutler, who both showed a pattern of looking beatable on Friday night's judging, and always managed to tighten up considerably for the Saturday evening finals. This year, Phil left the judging with a perfect score from the judges, which many felt was highly questionable. Oddly enough, Dexter Jackson, the man many felt had Phil on the ropes all weekend, looked about the same both days yet managed to climb from fourth place up to second. Shawn Rhoden dropped from second to third, and Dennis Wolf went down a notch from third to fourth place. On a related note, I did find it a bit troubling to hear that Phil considers the Friday night judging to be a "warm-up." To phrase it in those terms seems to imply that he knows he never needs to be at 100 percent, as he knows from experience that an improved look on Saturday always locks up a win for him.



"I really, genuinely like meeting you guys. When I shake your hands, it means a lot. I get chills sometimes from meeting people, because it lets me connect with them on a different level."

ON THE CHALLENGE HE FACED FROM THE OLYMPIA VETERAN, DEXTER JACKSON

"Look at Dexter. He was able to rise above all odds. I mean, no one had him even in their top five, let alone two. I had a feeling about that from the beginning of the prep, because I know he knows what it takes to be a champion and have that aggressive behavior. We had a great time up on that stage. He knew how to push me back when he was beating my butt back in '07 and '08 when he won his first Mr. Olympia. I learned a lot from Dexter. Just with being consistent, with being sharp on both days and being able to fix whatever is going on. That's what a true professional knows how to do, just like with any other sport."

ON BEING COMFORTABLE AND GRATEFUL IN HIS ROLE AS MR. O

"It's cool because I'm allowing myself now to embrace it all, because the last thing I want is to have it taken away, and I was just one-dimensional. I was just a bodybuilder. I can't live with that. I got to continually be a full person. I really, genuinely like meeting you guys. When I shake your hands, it means a lot. I get chills sometimes from meeting people, because it lets me connect with them on a different level. I know they're going through stuff, but what I'm doing is helping them get through it. It's just great, it's just positive energy, and I'm really thankful to be in this position."

Before leaving, Phil made a statement about how all of a sudden he wanted to do the Arnold Classic. This understandably got Tony Doherty excited, and he made Phil promise that if he did compete in Columbus, that he would also compete at his Arnold Classic in Australia two weeks later. Phil did agree to that, but stopped himself before making any further commitments— as he realized he was caught up in the heat of emotion after what many felt was a very closely fought win, which was by no means dominant. ■

A CUT ABOVE WITH 4-TIME MR. OLYMPIA JAY CUTLER



WHEN CLOSE-GRIP PRESSES ARE A PAIN

Do you ever get pain in your hands when you do close-grip bench presses? I can do normal bench presses and dumbbells fine, but any time I do close-grips it feels like someone is stabbing the outer portion of my right hand (my left hand is completely fine), like the meaty part under your pinkie. My grip isn't really that close, either.

I know exactly what you're talking about. Your hand is cramping because the bar is sitting the wrong way on your palm. You need to get the bar positioned right so it isn't pinching anything. Make sure the bar is in exactly the right area before you even take it off the rack. There have been times when I've felt that pinch in my hand and I had to put the weight back on the rack halfway through the set. One thing that also helps is using thicker bars, but not many gyms have anything except the standard Olympic bars. I use a product called Fat Gripz (www.fatgripz.com). They actually made me a custom pair that says Mr. Olympia on them. They fit over a regular bar and the main benefits are better grip strength in the hands and forearms, which has been shown to help with arm development. Fat Gripz would also solve your problem too, because the increased surface area of the bar you're holding means it's less likely to pinch a specific area.

FASTED CARDIO NOT FOR EVERYONE

For years we have been told to do cardio on an empty stomach to lose the most fat, but newer studies are showing it doesn't make any difference whether you have food—including carbs—in your system. I've always felt that doing cardio on an empty stomach can cause muscle loss, especially in a bodybuilder not using certain chemical items that act to preserve muscle. And what about mixing carbs and fats in the same meal when you're dieting? Most people still seem to think that's a bad idea. Do you?

I do cardio both ways, fasted or after meals. It all depends. If I've eaten a lot of food the day before and I haven't been asleep that long (I rarely sleep more than six hours), I will do my cardio on an empty stomach. But when I was getting close to a show and my metabolism was starting to really crank up, I would have a meal or two first. You have to understand that bodybuilders don't do cardio for quite the same reasons an overweight person would. We are already in decent shape (at least we should be), so the cardio is really done to boost the metabolism to assist the fat-burning process. An overweight person should do all their cardio in a fasted state, but bodybuilders need to be careful with that. If you're dieting for a contest and you've already gone eight hours without eating, doing your cardio on an empty stomach could cause you to lose muscle mass.

You should have a whey isolate shake or even a solid meal of just protein first, or do your cardio after your weight training. As for mixing carbs and fats in the same meal, I will do that for a couple of meals a day: something like steak and a sweet potato or salmon and rice. I tend to have these meals around my workouts, which are at night. The rest of the day I will eat protein and carbs, and very little fat. ■

T-BAR ROWS WILL BUILD MIDDLE TRAPS

Hey Jay, I have extremely wide and thick lats (probably my best muscle). But my upper middle back is really lacking in mass and thickness. What would you suggest to bring this up? I started doing barbell rows, pulling to my chest, to try and focus on my upper middle back. But the barbell rows take emphasis off my lats. I've tried doing seated cable rows with a wide grip, but I don't feel that exercise too much. What would you suggest?

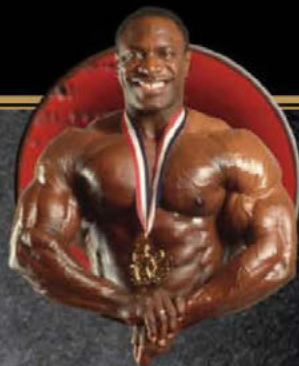
Doing old-school T-bar rows with the close-grip cable attachment under one end of an Olympic bar hits the middle traps pretty hard, and that's really the muscle group you're talking about here. Most guys have fairly decent upper traps from doing shrugs, but the bottom half of the trapezius doesn't get much at all from shrugs. Another great way to hit that area is deadlifts. To get the most out of them, roll your shoulder blades back and down at the top of each rep and squeeze the mid-back. You can also try doing partial deads in a Smith machine to focus purely on that part of the movement. The bent row is also a good choice, but you need to pull the bar to the line between your pecs and your top row of abs to target the lower part of the traps.

"Bodybuilders don't do cardio for quite the same reasons an overweight person would. We are already in decent shape (at least we should be), so the cardio is really done to boost the metabolism to assist the fat-burning process."

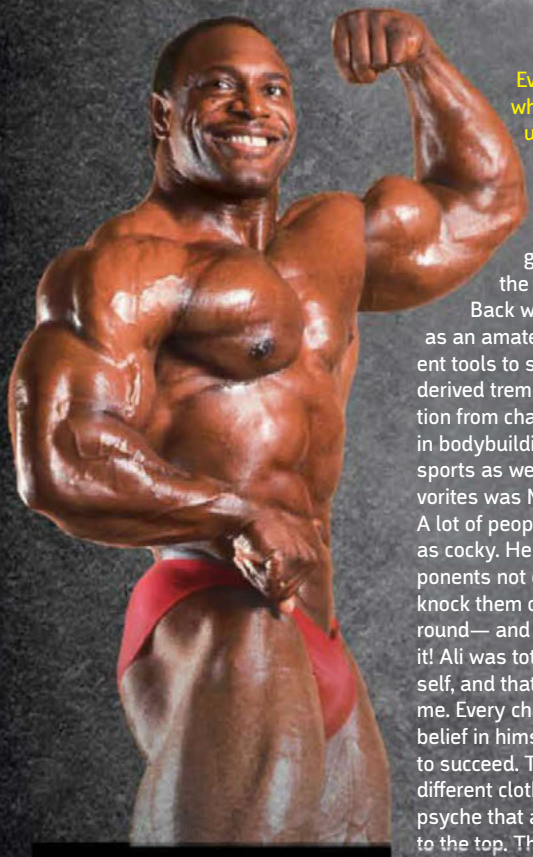


The Animal Kingdom

WITH 8-TIME MR. OLYMPIA LEE HANEY



THE BATTLEFIELD OF THE MIND



Everything we do in life begins in the mind. It determines where you go, and how you get there. This has been understood for millennia, as evidenced by Proverbs 23:7: "For as he thinketh in his heart, so is he."

How does this equate to being a great athlete and at the top of your game? Back when I was training as an amateur, I used different tools to stay motivated. I derived tremendous inspiration from champions not only in bodybuilding, but in other sports as well. One of my favorites was Muhammad Ali. A lot of people looked at him as cocky. He would tell his opponents not only that he would knock them out, but in which round—and then he would do it! Ali was totally sure of himself, and that attribute inspired me. Every champion has this belief in himself and his ability to succeed. They are cut from a different cloth, all with a similar psyche that allows them to rise to the top. They are different from ordinary people in the same way that a shepherd is different from sheep. The shepherd is a natural leader who guides the sheep and carries a staff. Of course, a champion in any sport does need to be born with a certain amount of physical ability in place. Champions really are born, not made. But he or she still has to train and have that inherent self-assuredness to get the most

out of it. If you watched great basketball players like Michael Jordan, Dr. J or Larry Bird, you knew they were one of a kind. Every Mr. Olympia is unique and special that way, too.

I remember being at the White House back in the 1990s and waiting to meet President Clinton. When he stepped into the room, the whole atmosphere changed. He just had an aura about him that people gravitated toward. It's a level of confidence and capability most people will never come close to.

In my years as Mr. Olympia, I used that mind power to my advantage over the other pros in a similar way that Arnold used it on his rival Lou Ferrigno in the movie "Pumping Iron." I remember being backstage at the 1988 Mr. Olympia contest in Los Angeles. We all had robes on like boxers, because they were going to have us weigh in at the press conference. There was only one mirror in the middle of the room. While everyone was lying around, I had my assistant Gilbert Ruiz take off my robe. Then I did some push-ups, had Gil put some oil on me and proceeded to knock out some poses in the mirror while the other guys all looked on. After that, I walked out as

they all showered me with compliments on how great I looked. That was my way of letting them know that there was me, and then there was all of them. I had won that contest before it even began.

I will leave you with a story about how you must never let negative comments or opinions affect your belief in yourself. In 1979, I was working as a bagger at the Ingles supermarket in Spartanburg, South Carolina and training for the Teenage Mr. America. Man, was I excited! I was helping an older gentleman put his groceries in his car and told him that I was leaving for Detroit to win the Teenage Mr. America title. He shook his head and said, "Son, don't get your hopes up. You're from this little town, and there will be young guys from big cities like New York and Los Angeles. You can't beat them." At that moment, I had to choose whether or not to believe him. I decided he was out of his mind and had no idea what he was talking about! A couple of weeks later, I did win that contest and beat teens from all over the country. I came home and put that four-foot-tall trophy in the front window of the grocery store. Soon that same man came in to shop again, and he saw me. He shook my hand and congratulated me, telling me, "Good for you, you believed in yourself even when I didn't."

I said, "Yes, I did." So believe in yourself. Always stay positive in your thoughts. You are what you eat, you are the company you keep, and you are most definitely the product of your thoughts and attitudes. ■

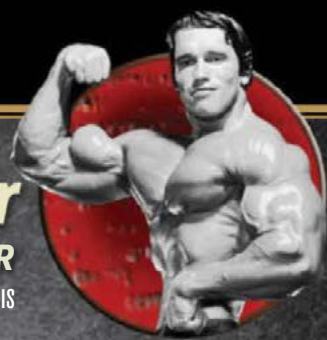
Got a question for Lee Haney? You can ask him directly on the MD website and have Lee personally answer your question! Go to www.musculardevelopment.com, MD Forums, MD Staff and Pros, Q and A for Lee Haney Zone.

"Believe in yourself. Always stay positive in your thoughts. You are what you eat, you are the company you keep, and you are most definitely the product of your thoughts and attitudes."

Arnold's Corner

WITH 7-TIME MR. OLYMPIA ARNOLD SCHWARZENEGGER

BY RON HARRIS



CHEST-TRAINING GEMS

FROM THE AUSTRIAN OAK

"It is cramping and it is being tortured. It is in pain. Because you have now shocked the muscle."

As I've said before, I'm glad Arnold decided to come out with his own supplement line, because a major part of his marketing was a series of videos done in partnership with Bodybuilding.com. The videos are titled "Arnold Schwarzenegger's Blueprint," and in them he discusses a wide range of topics including his early years, motivation and training tips. It's refreshing to hear new content from the man many of us were inspired by to start our own bodybuilding journeys many years ago. And it's also interesting to note that even though 40 years have gone by since Arnold was in his training prime, he still knows his stuff, and the methods he used to dominate the sport in the 1970s are just as applicable in 2016. This month, we look at some golden training advice he shared on the two largest muscle groups of the upper body, chest and back. First up, here's what he had to say about constructing a massive chest, as he was known for.

"I think that the three exercises for chest that I have always done, the first year when I started training and the last year when I was training, are the bench press, incline press on different levels, so they start low, medium, and high, and then flyes.

I mean, to me, flyes were an exercise that gave me the full pectoral development because I went all the way out, almost hitting the ground. And I was a big believer in expanding the chest as much as possible and getting that stretch, because remember with muscles, the important thing always is to get the stretch, and get the flex.

So to me, to go as far away with the dumbbells to get that stretch, and then to come in and have the dumbbells touch, and then flex like you're doing the most muscular, and then go out again, those are the kinds of exercises to me that you could not replace them with any machine. This was it."

After detailing what he felt were the holy trinity of chest exercises, Arnold then recognized

that at some point, chest gains will grind to a halt. Here, he discusses why we all will hit a plateau now and then, and how to burst through it.

"One of the main things when you are creating size, and to create muscle growth, is that sometimes your body will hit the wall. What that basically means is that the body is saying, I know all your tricks. I know you're gonna start with the bench press. Then I know you're going to walk over to the chin-up bar and do chin-ups. Then I know you're going back to the bench press, back to the chin-ups and so on. I know that routine. I know exactly everything you do, and I am prepared for that. So you have to go and use the shocking principle. The body, if it's chest, knows I'm gonna start with 135, and then 225 and 275. I'm gonna go now and I'm gonna start with 315.* And I'm gonna do 20 reps with 315, and then I'm gonna have the guys go and pull off plates, and I have 225 left. And then I'm gonna do another 10 reps. Then I'm gonna take another 45-pound plate off and I have 135 left, and I'm gonna do another 10 reps. Or maybe if I can, do another 15 or 20 reps, and let's see if the pectoral muscle is used to that. And then all of a sudden, you'll find that your pectoral muscle is shaking after that. And you don't know what to do because it is cramping and it is being tortured. It is in pain. Because you have now shocked the muscle." ■

**Note: I doubt Arnold would seriously suggest starting with 315 on the bench press without warming up, and simply neglected to mention that you should always warm up. So just to keep all of you safe, I am saying it—do not ever jump right into a weight that is very heavy on the bench press or any compound movement. To give Arnold the benefit of the doubt here, he routinely handled 500 pounds for reps on the bench press in his prime when he trained with Franco Columbu, so 315 pounds was not a weight he would have considered "heavy."*

Hardcore Q&A

WITH 8-TIME MR. OLYMPIA RONNIE COLEMAN



BELIEVE IN YOURSELF AND IGNORE THE DOUBTERS

I saw that Inc. 500 voted Ronnie Coleman Signature Series the number-one supplement company in the industry, and ranked it 208 among private companies in the world. How does that feel, especially when you know that when you started out, there were a lot of people doubting your company would even last a year?

It felt really good, because I worked so hard to get my company started and even harder to promote and grow it. I sold just about everything I owned to get the company off the ground, including vehicles I was pretty attached to. And making it an international success like it is now involves, and continues to involve, a ton of traveling. There have been several occasions when I was on the road for months at a time before I made it back home to Texas—and many, many times when I would sleep maybe an hour or two a night because I was doing so many appearances and having meetings. So to be recognized for that success feels fantastic. As for doubters, I never worried about anything they were saying. You have to believe in yourself, because a lot of people don't like to see anyone else succeed or do anything with their lives.

NO MORE INJURIES FOR ME!

I know you felt small and weak when you came back to training after you were forced to take three months off after your most recent back surgery. Small and weak is a relative thing, of course. Just how much lighter were you, and how much strength did you lose?

I went into the surgery weighing 275 pounds, and three months later I was down to 235. That was the lightest I had been since my early days of bodybuilding over 25 years ago. As far as being weak, it wasn't so much a matter of being weak as it was being really careful when I came back, and using super light weights. I was doing no more than 135 on the bench press, for example, and pressing and curling 20-pound dumbbells. I just did a ton of reps, like 20-30, going for a good pump. Every week I would use a little bit more weight, but keep the reps high. The last thing I want is another injury. I herniated disks in my back getting ready for the Arnold Classic in early 1996, almost 20 years ago, and I am still dealing with the repercussions of that injury. So I have no problem training light for a while, and I will take my time before I try to go anything close to heavy. No more injuries for me!

IF YOU SQUAT HEAVY, USE KNEE WRAPS

Should all bodybuilders use knee wraps for leg training, or only if you feel you need them? Did you always use them, or were wraps something you started using only toward the later part of your career?

I highly recommend using knee wraps. Of all the problems I have had from my many years of lifting heavy weights, my knees have never given me any trouble. I honestly believe that's because I always used knee wraps. Since I came to bodybuilding from powerlifting, it was something I didn't even think about. Come to think of it, I was already using knee wraps back in the weight room when I played college football. It was just something you did for safety and stability, like wearing a weight belt. When you squat heavy, you wrap. So I wrapped my knees as a bodybuilder, too. I did things like an 800-pound squat and a 2,300-pound leg press, and my knees have zero pain today at 51 years old and with eight Mr. Olympia titles.



STILL TRAINING AT METROFLEX

Where are you training these days? Are you mainly working out at Metroflex or in your home gym?

I split it up between the two. Metroflex became tougher to train at toward the end of my Mr. Olympia career because the place started getting kind of famous and everybody knew I trained there. Guys would be coming up to me to talk when I was on 100 grams of carbs a day and not in the best mood. It's gotten a lot worse over the last 10 years, because people started visiting Metroflex from all over the world. A lot of them came hoping to meet me, talk to me and

take pictures with me. Some of them were coming from places as far away as Japan, Germany, Australia and even South Africa. Of course, I had to at least talk to them a little bit if they came all that way. Plus, the gym just got a lot more crowded in general. I used to train at 5:00 p.m.-6:00 p.m., but it got too crazy for me. Now if I go, I go 10 or 10:30 at night when there are only a few people in the whole place. ■

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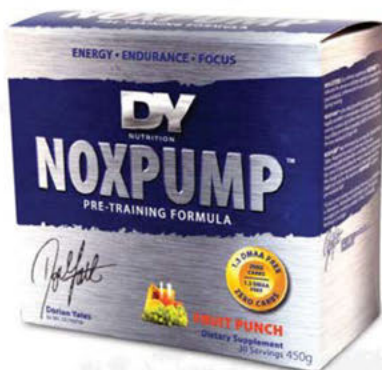


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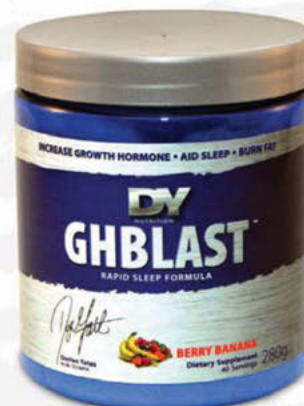
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Blood & Guts

**WITH 6-TIME MR. OLYMPIA
DORIAN YATES**



BLOOD AND GUTS SUCCESS STORIES

You have put several noted pro bodybuilders through your unique Blood and Guts style workouts, yet none of them have dared to switch over to that style full time. However, there have been many others you have trained who did. What are some of the best gains you have seen these men make over time, training your way?

I don't feel I can really answer this question with certainty, only because I have never trained anyone consistently over a long period of time and followed his progress. The closest I came to that was a six-month period when Zack Khan would drive down a couple of times a week to have me train him at Temple Gym. His back and legs were fairly mediocre at the start, and those were the areas we worked on when he

came down. Six months later, he had made very noticeable gains in both muscle groups.

Chris Cormier came over a few years ago to stay and train with me for a while. By that point, he was already in his 40s and was very limited with what he could do because of a couple of serious injuries. But he did say that if he had been training my way from the start of his pro career, he was sure he would have won at least one Mr. Olympia title.

Many others have come out to train with me, mainly for the experience. Most of them come from the standard volume style of training, and were in a constant state of overtraining. The ones who made the change to briefer, higher-intensity workouts, as I'd shown them, did often drop me an email or a message on Facebook to let me know they had made significant gains. Most of them were regular people, not high-level, competitive bodybuilders. But I am certain that the Blood and Guts approach to training is the most efficient and productive.

THE GOOD OLD DAYS OF BETTER GEAR

You as well as many other retired pros have said that the steroids used back in the '90s and before were of much higher quality and potency than the underground gear today's competitors use. If you were competing today, do you think you would have to use higher doses than what you did back in the '90s to compensate for the lower potency?

I do agree that on the whole, the gear back in the 1980s and '90s was superior. There was very little counterfeit stuff. Most of it was made by legitimate pharmaceutical companies. As time went by, most of them stopped producing steroids, and let the patents and trademarks on various products expire. That's why you sometimes see supplements with the same name as popular actual steroids from the past. But if I were using gear now, I wouldn't simply take more of it in the blind hope that it would give me the desired dose. I'd be more careful about

what I put in my body, and I would send samples off to a lab for analysis. I would want to be sure what the drug was, how much of the drug was actually in a dose and also make certain it had no bacteria or other impurities. If any of you have the means to do so, I would highly suggest you do so.

TODAY'S GYMS CATER TO WIMPS

It seems to me as if all the very best training equipment was made in the 1980s and 1990s, including pieces from companies like Nautilus, Hammer Strength, Cybex, Body Masters and Flex. There must have been some research and innovation in the decades since, so why don't we have machines being produced today that are superior and more effective?

I completely agree with you, which is why I insisted on having classic pieces from those brands for my new DY Gym in Marbella, Spain. All of them have been reconditioned so they look and function just like new. The reason that era produced better equipment is because it was made for and by athletes and bodybuilders. A great deal of effort was expended to ensure the equipment worked the target muscles as effectively as possible. You may or may not know that Hammer Strength machines were designed by Gary Jones, the son of Nautilus owner and inventor Arthur Jones.

Gyms now, if you can even call them gyms, no longer cater to athletes or even serious trainers. They cater to regular people who don't want to work hard. Some of them will even kick you out for making any noise when you train, or for doing certain exercises like squats or deadlifts. I'm not kidding! You can see this wimpy attitude reflected even in the cardio pieces made today. Back in the old days, you would get on a Lifecycle, set it to level 8, and that was tough! On today's version, the same level 8 hardly requires any effort. Any gym I am ever going to own or be affiliated with is going to have great hardcore equipment, and hard training will always be encouraged rather than forbidden. ■

"Gyms now, if you can even call them gyms, no longer cater to athletes or even serious trainers. They cater to regular people who don't want to work hard. Some of them will even kick you out for making any noise when you train, or for doing certain exercises like squats or deadlifts."



The Blade

WITH 2008 MR. OLYMPIA DEXTER JACKSON



"If I'm ever sick with a bad cold or something, I have no problem taking an extra rest day because I know it's the smart thing to do."

IN THE GYM, IT'S ALL BUSINESS

I know that Gold's Gym in Venice is constantly full of tourists from out of town or even out of the country, hoping to see a few famous bodybuilders. Meanwhile, when you are in there training with Charles Glass, it's all business. How often do fans interrupt you when you're training, and how do you deal with it? Does Charles run interference for you?

I'm not the type of guy who trains with headphones on and gives dirty looks to anyone who tries to make eye contact with me in the gym. The thing with me is, I am all business and 100 percent focused when I am doing my set. In between sets, I can joke and laugh. Arnold was like that too. So if someone wants to take a picture with me, I don't have a problem doing it quick before I start my next set or my next exercise. I will even take two or three if there's a little group and it's fast. There are times when I am in the final two or three weeks before a show, and things are getting down to the wire. I am low on energy, and it's all I can do to put out the effort I have to during my workout. At other times, Charles and I have to keep things moving pretty fast because one or both of us is short on time and we need to get done at a certain time. At those times, Charles will be the bad guy for me and tell people to please wait until after the workout, and then I will be happy to take a picture. And I will. I'm grateful he is the one to tell people the workout can't be interrupted, because I have a hard time doing that.

WORKING CALVES UNTIL THE COWS COME HOME

Have you ever had a body part that was so stubborn that you had to work it extra hard or more often to get it to catch up? And have you ever had a body part that grew so easily that you had to stop training it?

My calves have been the only truly stubborn body part. I work everything else once a week. In the off-season, I hit them twice a week, and work them three times a week when I'm in prep. They're never going to be huge, but they are a little better than they

were years ago. Nothing on me ever grew much faster than anything else or responded so well that I ever had to stop training it. I wish my calves were like that!

TAKE EXTRA REST DAYS WHEN YOU NEED THEM

Dexter, do you stay flexible with your workouts when it comes to taking extra rest days if you feel you need them? Or do you always train on the days you are supposed to? Is this something that would be different in prep as opposed to your off-season?

I'm definitely more flexible in the off-season. Then, I will often take a couple of extra rest days if I'm going to be traveling and it just makes sense. Or more likely, I will train more days in a row than normal, knowing that I won't be able to train for a couple of days on the road. And of course, if I'm ever sick with a bad cold or something, I have no problem taking an extra rest day because I know it's the smart thing to do. Once I am in prep mode, I train when I'm supposed to and rest when I'm supposed to. That way, there is no confusion, I don't get off schedule and I never have to "make up" for any lost workouts.

HOW OFTEN SHOULD I WEIGH MYSELF?

I think I might be obsessed with weighing myself. I usually weigh myself about three or four times every day, because I am always trying to be heavier. Does that sound normal to you? How often do you weigh yourself?

No, that does not sound normal. You seem to have issues with needing to weigh more. Don't you get depressed a lot, since you can't possibly be gaining weight all the time? I would try cutting that back to once a day, then every four days and then once a week. There's no point in weighing yourself multiple times a day. Any differences in your weight over the course of a day are just based on how much food and water you have in your system. You're not gaining or losing any significant amount of fat or muscle every few hours! ■

VISIT DEXTER'S OFFICIAL WEBSITE:

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Got a question for Dexter Jackson? You can ask him directly on the MD website and have Dexter personally answer you! Go to www.musculardevelopment.com, MD Forums, MD Staff and Pros, Q and A for Dexter Jackson.

DETAILING YOUR MIDDLE BACK *WITH* **CABLE CROSSOVER LAT PULLDOWNS**

Extraordinary width, mass and thickness are part of what is needed to achieve bodybuilding success. However, wide backs that are smooth and without separation will only impress folks at the gym, and not the judges at a competition. Winning backs require hard, dense, width with unlimited thickness—but not many bodybuilders take the time to deviate from lat-bar pulldowns in their quest for back greatness. The constant tension imposed by cable crossover lat pulldowns provides a great option to wide-grip lat

pulldowns for building width, and will allow you to pile on latissimus (or “lat”) thickness along with middle back detail and density.

MUSCLE STRUCTURE AND FUNCTION

Several muscles contribute to a wide upper back, and all are activated by cable crossover lat pulldowns. The fibers of the latissimus dorsi muscle extend from the lower (inferior) thoracic vertebrae, the iliac crest of the hip and the thoracolumbar

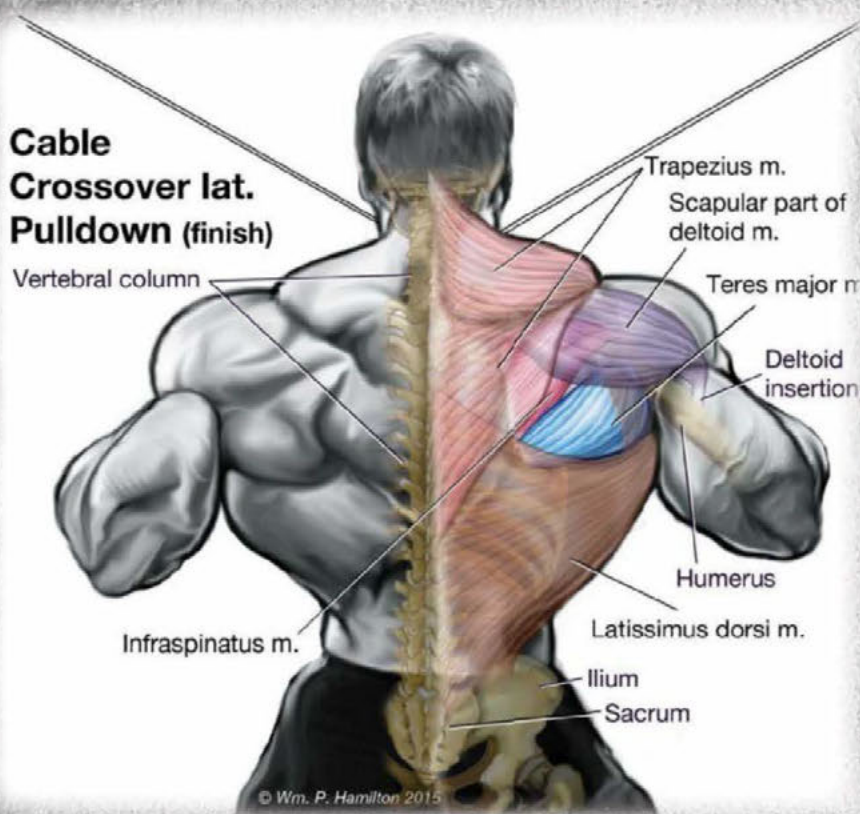
fascial covering the lower back to converge on the upper (superior) portion of the humerus bone of the upper arm near the shoulder.² The latissimus dorsi fibers extend over the humerus bone of the arm (pull the upper arm backward), adduct the humerus (bring the arm toward the center of the body) and medially rotate the arm at the shoulder.^{1,3} The middle fibers of the latissimus have a more direct pull, with the hands and arms working at mid-chest level.^{3,4} The upper fibers are best activated with the arms a little above shoulder height. Working with the arms over the head tends to activate the middle and lower parts of the latissimus muscle more effectively.³

The teres major muscle provides width to the upper back immediately in the region of the axilla (armpit). It begins on the inferior angle of the scapula (shoulder blade), but it attaches high into the same region of the humerus bone of the arm as the latissimus dorsi.¹ Similar to the latissimus dorsi, the teres major muscle abducts and medially rotates the humerus.⁴ It also extends the humerus from a flexed position (i.e., with the arm forward).¹ The teres major is most intensively activated with the arms at mid-chest level or in work directly overhead, and this is the position that the arms are in to begin cable crossover lat pulldowns.

The teres minor is a rotator cuff muscle that provides the final width to the upper back in the axilla, below the shoulder joint.¹ It begins on the superior (upper) part of the lateral border of the scapula bone, and it attaches into the inferior part of the humerus near the shoulder. In addition to its ability to laterally rotate the humerus, the teres minor helps to pull the arm backward into extension.⁴

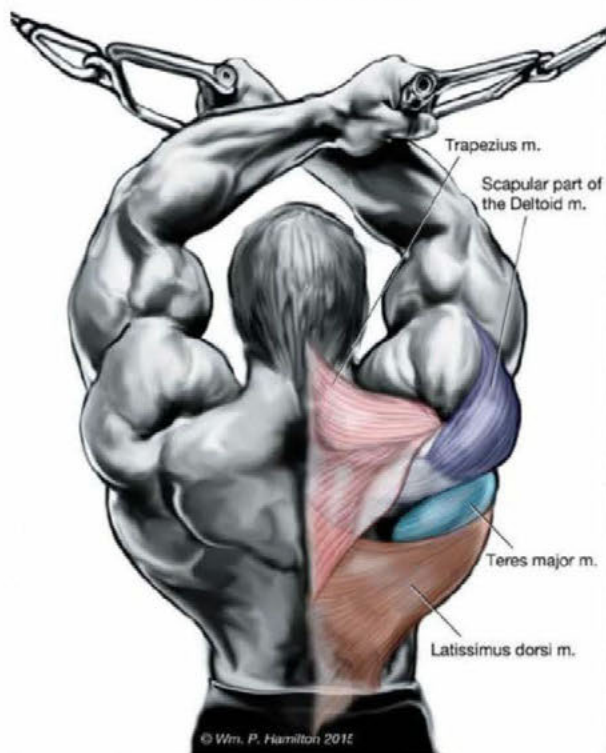
The scapular fibers of the deltoid attach along the spine of the scapula (shoulder blade), which is on the upper and posterior side of the scapula.¹ The fibers of the deltoid converge on the anterior and upper portion of the humerus bone. The scapular (posterior) fibers of the deltoid muscle create horizontal abduction of the humerus bone¹, and therefore help to pull the arm backward and to the side in cable crossover lat pulldowns.^{4,5}

The superior trapezius connects the base of the skull and the seventh cervical (neck) vertebra to the lateral part of the clavicle and the scapula.¹ The superior trapezius muscle moves the scapula superiorly.¹ The middle one-

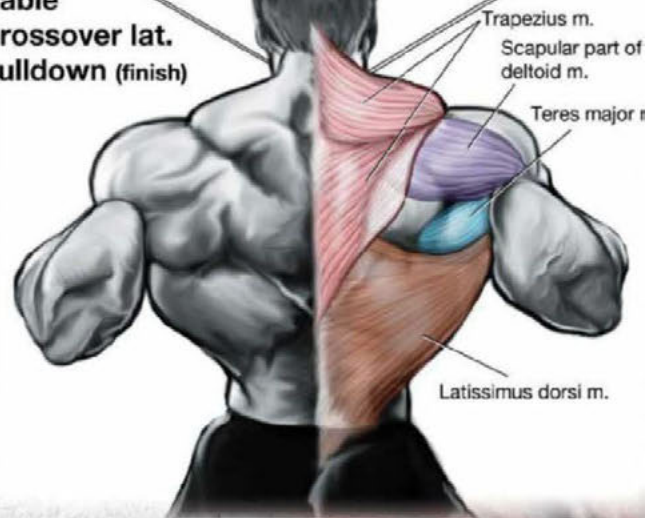


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Crossover Cable Latissimus Pulldown (start)



Cable Crossover lat. Pulldown (finish)



third of the trapezius muscle stretches from the upper thoracic spine, laterally to the posterior side of the scapula and clavicle. The fibers of the middle (medial) segment of the trapezius muscle cause an upward rotation of the scapula so that you can bring your arm over your head.¹ They also help to “squeeze” the two scapula bones toward the midline of the body (adduction of scapula)⁶, which occurs at the end of each contraction in cable crossover lat pulldowns.⁷

CABLE CROSSOVER LAT PULLDOWNS

1. Position yourself between two high pulley cables. Select a resistance with which you can get 10-12 repetitions.
2. Take the handle from the right high pulley in your left hand, and the left handle from the high pulley in your right hand. Position your hands in a pronated grip (palms toward the floor) and start with your hands at a medium shoulder width.^{8,9} The cables will be crossed over each other and slightly in front of your face.
3. You may prefer to kneel, as this position may provide greater stability to your body. The exercise can be done standing.
4. Start with your hands above your head. Exhale as you pull your arms down to your sides and backward in an arc.
5. Stop when your forearms have reached a position that is parallel to the floor with your elbows pulled as far back as possible. Your hands should be approximately at mid-chest level.
6. Try to squeeze your shoulder blades (scapula) together (scapular abduction) and keep your chest high with your arms pulled backward (extension of the humerus) at this bottom position.
7. Inhale as you return the cables to the starting position with your hands above your head.

CABLE CROSSOVER LAT PULLDOWNS

The exercise stresses the extension and abduction functions of the humerus, which means that the latissimus dorsi, teres major, teres minor and trapezius muscles are all strongly activated to pull the arms downward.

You should experience a great pump, and your lats will feel 10 feet wide after only one set. With a good diet, you will be surprised at how quickly the details and separations in your middle and upper lats will develop. However, the great thing about this exercise is that in addition to adding new width, you will be adding definition, separation and hardness to the mass in your back.

If your goal is to make it to the biggest stage in bodybuilding, or even if a championship is not in your destiny, a few months of cable crossover lat pulldowns can establish phenomenal upper-body thickness and width, with ripped-to-the-bone detail that will be worthy of many championships. ■

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OFF-SEASON 101

NUTRITION

PART 1

This month, as we continue looking at off-season issues, we begin an in-depth look at proper nutrition, breaking down the three macronutrients of protein, carbohydrates and fats.

ALL PROTEINS ARE NOT CREATED EQUAL

Protein provides our bodies with the basic building blocks for muscle tissue, which makes it essential in a bodybuilder's diet. However, some athletes make no distinction among the quality of various protein sources. For example, you can certainly get all your protein from a McDonald's hamburger—but I wouldn't recommend it. The reason is that they contain roughly 75 percent fat (144 fat calories out of 204 total calories, and only 15 grams of protein in one patty). Contrast this to a

an epidemic of hypertension and diabetes in the USA. If you are prone to water retention, a sodium intake of this level would have you swollen like a balloon. Due to the high content of fat, sodium and miscellaneous preservatives found in fast-food burgers, eating them on a regular basis will have you feeling lethargic, weak and feeling miserable in general.

Even if you have steak, you should be conscious of the fat content. The leaner cuts of beef include top round, top sirloin, eye of round and filet mignon. Once you start getting into ribeye, porterhouse or New York strip steaks, the fat percentage will be much higher.

Next up is probably the most common protein source for bodybuilders, chicken. Again, the quality of chicken can vary greatly. There is a big differ-

of sodium.

Another good protein source is pork, which has a fairly high biological value (BV). The biological value of a protein is a value that measures how well the body can absorb and utilize a protein, based on how much nitrogen content of the food is retained by the body. Pork tenderloins are lean and easily digestible, more so than most red meat and comparable to chicken breasts. Obviously, there are also much fattier types of pork to avoid, such as bacon and sausages.

Since we are on the subject of biological value, eggs happen to have the highest BV of all naturally occurring protein sources. However, eggs do contain a large amount of sodium, even when you buy them in the form of Egg Beaters. That's something to be aware of. I tend to have my clients combining whole eggs and egg whites in the off-season.

Fish is another source of high-quality protein. If you need a lot of calories, salmon is a great choice, and it also contains heart-healthy omega-3 oils. It has a different consistency than something like halibut or orange roughy due to all the oil. Tuna is also a good option, as it's convenient and fairly inexpensive. Again, if you are looking for the best-quality protein, opt for white albacore.

Finally in our discussion of protein sources, we come to milk and dairy products. I have no problem with them at all, as long as you aren't lactose intolerant. If you happen to be, you can still have dairy in your diet as long as you take Lactaid pills with those meals. You can also find lactose-free milk products. ■



"Some athletes make no distinction among the quality of various protein sources. You can certainly get all your protein from a McDonald's hamburger—but I wouldn't recommend it"

hamburger served at a steakhouse, which would have a fat percentage in the teens or lower. This is because a steakhouse uses a much higher quality of beef, typically ground sirloin steak. Fast-food burgers often use various trimmings from the cow, much the same way that hot dogs include parts of a pig you wouldn't want to eat.

Another reason not to eat too much low-quality beef is the sodium content. Often you will find as much as two to three grams of sodium in a fast-food meal. Multiply this by two or three of these meals a day, and you can see why there is

ence between a chicken breast and a box of Chicken McNuggets from McDonald's, and again it's mainly in the protein to fat ratio, sodium levels and preservatives. I also warn my clients about sodium solutions that a lot of grocery chains are pumping into their chicken to make them juicier. Most of the time when you buy bags of frozen chicken breasts from bulk retail stores like Costco, BJ's or Sam's Club, they contain massive amounts of sodium to improve the taste. To avoid putting yourself at risk of hypertension, read labels carefully to make sure you aren't taking in potentially dangerous amounts

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TRAINERS OF CHAMPIONS

with The Bodybuilding Wizard & Master Trainer Charles Glass



TIME UNDER TENSION MAKES WEIGHT FEEL HEAVIER

Charles, I have severe arthritis in my right shoulder. My orthopedic surgeon recommends a full shoulder replacement, but I am not interested in going that route quite yet. The only things it limits in my training are presses for chest and shoulders. I can do them, but I have to go lighter than I used to— a lot lighter— and machines are now a safer bet than barbells or dumbbells. Can you give me any tips on how I can still work my chest and shoulders hard if I can't go very heavy anymore?

Sorry to hear about your arthritis, but I'm sure you know how common it is. Almost 40 million Americans suffer from arthritis. Just for the readers, here is a brief definition of the condition from the Centers for Disease Control and Prevention (CDC):

"The word *arthritis* actually means joint inflammation, but the term has acquired a wider meaning. In public health, arthritis is used as a shorthand term for arthritis and other rheumatic conditions— a label for the more than 100 rheumatic diseases and conditions that affect joints, the tissues which surround joints and other connective tissue."

What I suggest you do on your pressing movements for chest and shoulders is to slow the reps down and give your muscles greater TUT, or time under tension. Push up with a 10-second positive on each rep, pause to contract your pecs or delts, and lower it at the normal speed of about one second. Muscles really don't know resistance. By extending the amount of time they

are under tension while contracting, you can make a lighter weight feel much heavier, and essentially "trick" the muscle into responding the same way it would with a heavier load.

100-REP SETS FOR KILLER PUMP

I have seen a couple of articles about a training method used by IFBB pro Moe Moussawi that involves doing 100-rep sets. I think I recall seeing something about 100-rep sets many years ago, too. In your opinion, could doing a light weight for 100 reps actually stimulate muscle growth? I can see getting a crazy pump from it, but wouldn't the resistance be

much too light to cause a growth response?

You are correct that 100-rep sets are nothing new. I can recall hearing about them as far back as the early 1980s, and it wouldn't surprise me one bit if bodybuilders were doing them 10 or 20 years even before then. They can be an excellent plateau buster for a lagging body part. Because they are so demanding and will do so much damage to the muscle cells, you would definitely not want to do 100-rep sets all the time. One workout, featuring two or at the most three 100-rep sets of two or three different exercises for a given body part, could be done once every three or four weeks— no more often than that.

There are different ways to do 100-rep sets. Some people do use the same weight for all 100 reps, but I agree with you in that anything you could do for 100 continuous reps is far too little resistance to properly stimulate the muscle. Instead, I would do it over three to five drop sets of 20-30 reps each. So if you were doing cable curls, the progression might look like this, with no rest in between:

120 x 30
100 x 25
80 x 25
60 x 20

Talk about a pump! You wouldn't

be able to bend your arms for a few minutes. If you do decide to give 100-rep sets a try, forget about compound free-weight movements like squats, bench presses, military presses or barbell rows. By the time you get close to 100 reps, I guarantee that fatigue would destroy your technique and put you at risk of injury. Stick with machines and cables.

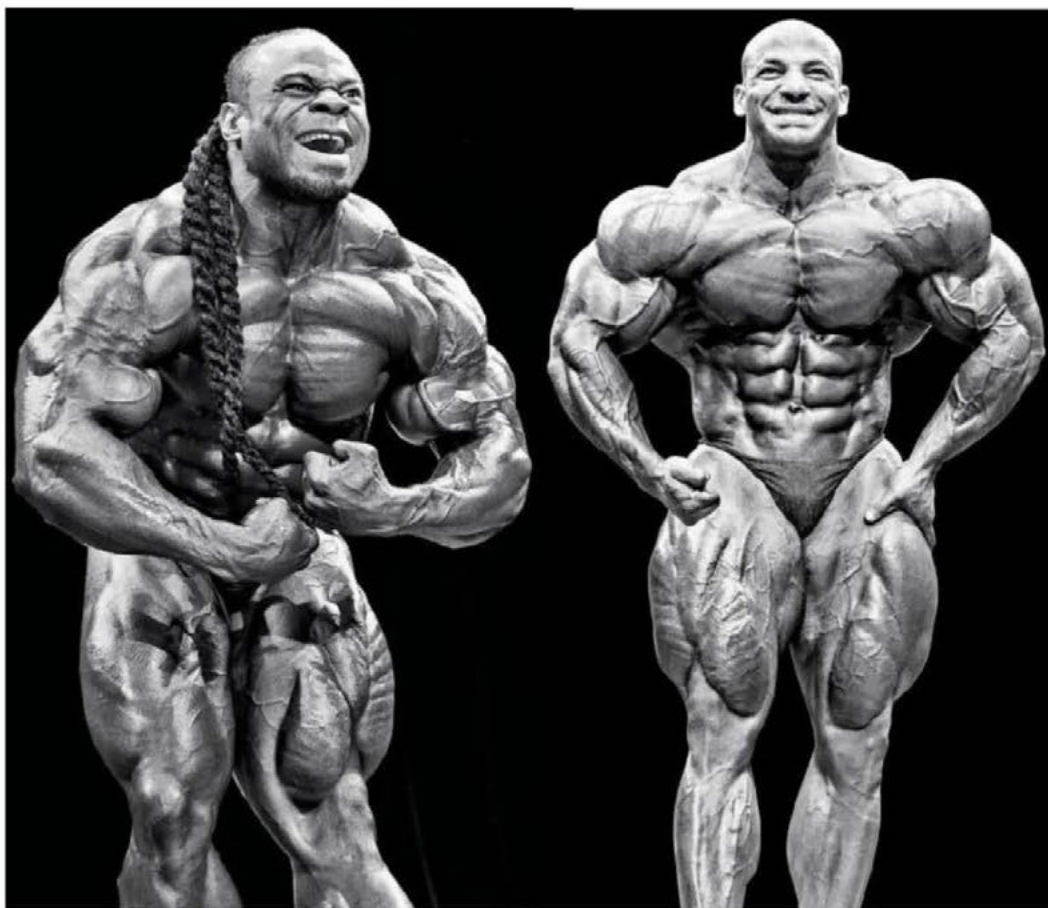
IMPROVE YOUR GRIP STRENGTH FOR BIGGER ARMS

Charles Poliquin has said that improving your grip and forearm strength will lead to great overall size and strength in the biceps and triceps. I really couldn't care less about my grip, but I will work on it if it could help my arms grow. What are your thoughts?

I totally agree with Mr. Poliquin here. Very often, your grip will go on upper-arm movements before the biceps or triceps are truly fatigued. Back in my gymnastics days, we had a cheap yet very effective way to strengthen our grip, which of course was vital on the rings and the parallel bars. We would squeeze a new tennis ball as hard as we could for sets of 20-30 reps every day. Once the ball started getting soft, we threw it out and took a new one to use. Try that out. ■

"Muscles really don't know resistance. By extending the amount of time they are under tension while contracting, you can make a lighter weight feel much heavier, and essentially 'trick' the muscle into responding the same way it would with a heavier load."





"We are already planning our strategy to take the next Olympia by storm."

WHAT'S IN STORE FOR KAI AND BIG RAMY?

George, can you please clear the air and put an end to the stories going around, like that Kai is no longer with you and Big Rami left the team, etc.?

Wow, that's all news to me. I just got off the phone with Kai and as a matter of fact, we just started our plan of attack for this year, starting with the Arnold Classic in Columbus, Ohio. As far as big Rami, I'm not sure why everyone thinks that he wants to leave me after the amazing job we did this past season—and it keeps on getting better. I doubt that Rami is even thinking about any other coaches, and we are already planning our strategy to take the next Olympia by storm. So just so everyone knows and to put the rumors to rest, both of these great champions are still on Team Farah.

KIDS AND WEIGHTLIFTING: GO FOR IT

Mr. Farah, I have a son who is 13, and he has been bugging me to get him a gym membership. I'm not sure if it is wise, but I figured I would ask your opinion. I have been following you for years, and you seem to have a great deal of knowledge when it comes to our sport we all love. Thank you in advance, sir.

Great question, and many people have asked me the same exact question, many times before. Honestly, I don't understand what's the big deal, and why many people are against kids and weightlifting. Thirteen is a good age, but I advise against heavy weights, especially anything over the head like squats or the shoulder press. As long as you keep these few things in mind, and

everything is done moderately, your son should be perfectly fine. And by introducing him to the gym, you might even be keeping him away from bad things that kids his age can get in trouble with. The gym was the best savior for me, growing up in Lebanon during the Lebanese civil war.

THE SCOOP ON PROTEIN

Guru, there are so many proteins to choose from. In your opinion, which one is the best to include in my diet?

Honestly, your question isn't very clear. If you mean what type of protein powder to use, then it's a much better question. I like my clients to use hydrolyzed whey protein upon rising and immediately post-workout, to help stop the catabolic state at once and to help ensure the muscles are pro-

tected. During other times of the day, I would stick with a little less expensive protein like the isolate or concentrate. At night, of course, I would switch to casein because as we all know, it stays in your system much longer to help you stay in a positive nitrogen balance while asleep and to prevent you from going catabolic. Hope this helps. ■

George Farah is presenting his opinions and he does not, in any way, shape or form, encourage or condone the use of any illegal or controlled substances.

Nothing contained herein is to be construed as medical advice. Use of any drugs and exercise regimen should only be done under the directions and auspices of a licensed physician. The writer does not claim to be a medical doctor nor does he purport to issue medical advice.

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Will Supplements Send YOU to the ER?

DO DIETARY SUPPLEMENTS REALLY SEND 23,000 PEOPLE TO THE EMERGENCY ROOM EVERY YEAR?

If you listen to the alarmist rants of mainstream journalists lately, you're a dead man or woman walking if you pop a tablet of vitamin C or drink a protein shake. The latest scare stories cite a new study published in the *New England Journal of Medicine* suggesting that 23,000 people go the emergency room (ER) annually due to supplements. The study's team of authors, including four from the Centers for Disease Control and Prevention (CDC) and three from the U.S. Food and Drug Administration (FDA), reviewed ER visits to 63 hospitals between 2004 and 2013, which were reportedly associated with dietary supplements. The results provoked hyperbolic stories like "Death by Dietary Supplement" by a former FDA drug regulator in *Forbes*, alleging marketers can "get away with anything. Including murder." Expect more of the same, since anti-supplement stories fit perfectly into the "something in your cabinet is killing you" model of modern news.

But before we throw all our vitamins in the trash, let's take a closer look at those supposed 23,000 visits per year. For starters, we're not talking about 23,000 actual visits at all, but rather researchers' projected calculations based on the hospitals they reviewed. These projections improperly included products that are not dietary supplements at all, such as eyedrops, eardrops, homeopathic products and skin creams. Further, much of the data collected predates June 2010, when the FDA's current Good Manufacturing Practices (CGMPs) were fully phased-in throughout the industry. Data from before these enhanced quality-control standards were imposed industrywide may have limited application to today's market.

But even adopting their numbers, more than 20 percent of those estimated visits involved unsupervised children under the age of 4 who got hold of their parents' vitamins. Another 20 percent were elderly people who simply couldn't swallow the vitamin pill itself and choked. Without these, we're down to an estimate of 14,000 or so. That's 14,000

out of the more than 150 million adults Americans who take dietary supplements—far less than one-tenth of one percent. And of those, the vast majority were treated and released. The estimate for actual hospitalizations is less than 2,200 per year—startlingly low.

"The facts are that adverse events from supplements are extremely low, given their widespread usage," said Dan Fabricant, Ph.D., executive director and CEO of the Natural Products Association, in a news release. Fabricant continued, "and most of these are the result of three factors: accidents, people not consulting with their doctor, or misuse of a product combined with other health factors. Supplements are safe, which is why millions of Americans use them every day."

Anti-supplement stories fit perfectly into the "something in your cabinet is killing you" model of modern news.

After weeding out the unsupervised kids and their choking grandparents, most of the cases involved weight-loss products or energy boosters. These products were connected to more than half of the ER visits for young adults between the ages of 20 and 34, typically for cardiac symptoms such as rapid heartbeat, chest pain or palpitations. "The current common denominator for this category is caffeine," says Chris Lockwood, Ph.D., CSCS, a longtime industry consultant, "but the concentration per serving is typically less than you'd find in a venti Caffè Americano." Still, Victor Prisk, MD, a popular columnist for this magazine, advises consumers against the "more is better" mentality, especially with stimulants, saying, "Weight loss means lifestyle changes, not a magic pill." Dr. Prisk advises speaking with your physician about any interactions that your supplement regimen may have with your prescribed medications.

Doug Kalman, Ph.D., co-founder of the International Society of Sports Nutrition and another

well-known industry authority, suggests that consumers research products fully before taking them, particularly if the products are weight loss or energy products, and if the consumers have previous heart problems. All the experts agree that more research needs to be done by industry companies on finished products that stack a variety of stimulants together.

Dietary supplements can play an important role in keeping you healthy and strong. Educate yourself and use them responsibly—don't exceed label instructions, and speak with your physician before taking stimulant products, particularly if you have had any heart problems. Meanwhile, always take what you hear or read in the mainstream media with a big grain of salt. ■

Rick Collins, JD, CSCS (www.rickcollins.com) is the lawyer that members of the bodybuilding community and nutritional supplement industry turn to when they need legal help or representation. [© Rick Collins, 2015. All rights reserved. For informational purposes only, not to be construed as legal or medical advice.]



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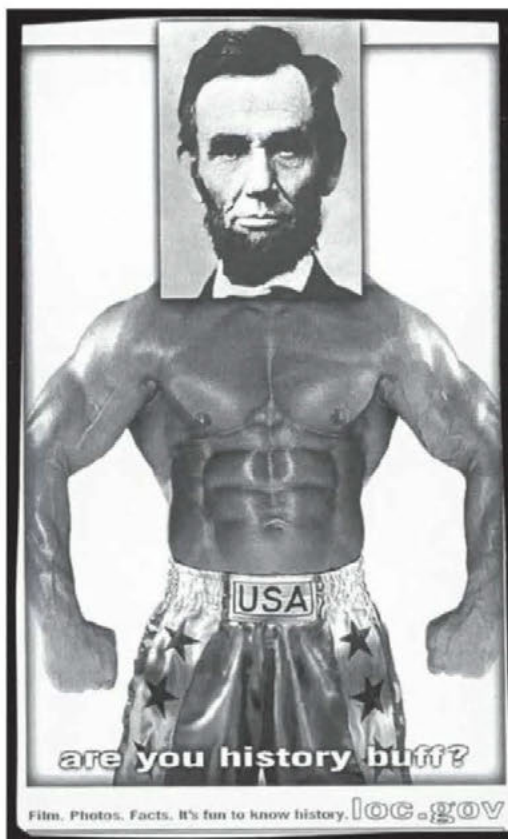
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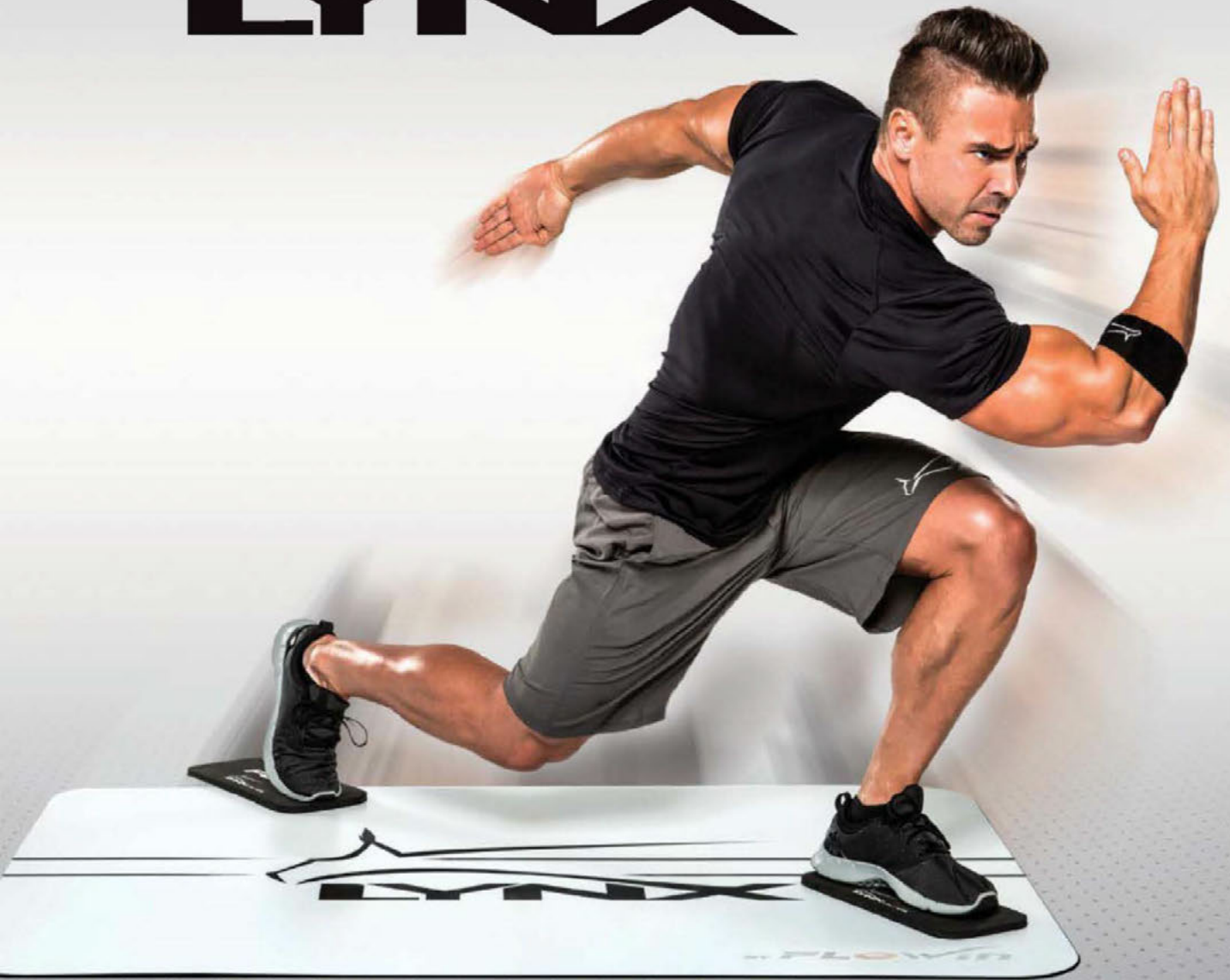


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